

W 79.1. 940
W 79.1. 940 ✓

ANNUAL REPORT OF THE
GOVERNOR OF THE
PANAMA CANAL, 1940

386
P187

**UNIVERSITY
OF FLORIDA
LIBRARY**



Digitized by the Internet Archive
in 2010 with funding from
University of Florida, George A. Smathers Libraries with support from Lyrasis and the Sloan Foundation



Dredge at work at site of excavation for bypass channel for Third Locks.

ANNUAL REPORT
OF THE
GOVERNOR OF
THE PANAMA CANAL
FOR THE
FISCAL YEAR
ENDED JUNE 30
1940



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1941

386
P. 87

NOV 10 1981
VIA 9811

TABLE OF CONTENTS

	Page
Introduction.....	1
Operation and maintenance of the Canal.....	2
Operation of auxiliary enterprises—business operations.....	2
Government—administration.....	2
Services rendered by the Canal to shipping.....	3
Net revenues.....	3
Replacements.....	4
SECTION I.—CANAL OPERATION AND TRADE VIA THE PANAMA CANAL	
Statistics of Canal traffic.....	5
Canal traffic by fiscal years 1915 to 1940.....	9
Traffic by months—fiscal years 1940 and 1939.....	10
Tanker traffic.....	10
Nationality of vessels transiting Canal.....	12
Cargo carried by vessels of leading maritime nations.....	12
Vessels paying tolls on displacement tonnage.....	13
Vessels entitled to free transit.....	13
Small commercial vessels transiting the Canal.....	14
Cargo shipments segregated by principal trade routes.....	14
Origin and destination of cargo.....	15
Principal commodities.....	20
Classification of vessels between laden and ballast traffic.....	21
Laden and ballast traffic by nationality.....	24
Average tonnage, tolls, and tons of cargo per cargo carrying vessel.....	24
Steam, motor and other vessels.....	25
Frequency of transits through the Panama Canal.....	25
Gross tonnage of vessels.....	27
Summary of passenger movement at Canal during 1940.....	29
Transient passengers.....	29
Canal operation and maintenance.....	30
Hours of operation.....	30
Operating schedule of locks.....	31
Lockages and lock maintenance.....	31
Power for Canal operation.....	32
Water supply.....	34
Dry season, 1940.....	35
Floods.....	35
Madden Lake.....	35
Madden Dam.....	36
Maintenance of channel.....	36
Ordinary channel maintenance.....	37
Special maintenance projects.....	38
Slides.....	38
Subsidiary dredging division activities.....	39
Equipment.....	40
Ferry service.....	41
Marine activities.....	41
Aids to navigation.....	42
Accidents to shipping.....	42
Salvage and towing.....	42
Meteorology—hydrology—seismology.....	43

SECTION II.—BUSINESS OPERATIONS

	Page
Panama Canal business operations.....	45
Mechanical and marine work.....	46
Drydocks.....	46
Marine repair work.....	47
Work other than marine work.....	47
Plant improvements.....	48
Electrical installation and repair work.....	48
Purchases and inspections in the United States.....	49
Stereohouses and ship chandlery.....	49
Obsolete and unserviceable property and equipment.....	50
Fuel oil, Diesel oil, gasoline, and kerosene.....	50
Building construction and maintenance.....	50
Quarters for employees.....	51
Replacement of quarters for American employees.....	52
Motor transportation.....	54
Panama Canal Press.....	54
Revenues derived from rental of lands in the Canal Zone.....	54
Business operations under the Panama Railroad Co.....	55
Trans-Isthmian Railroad.....	55
Receiving and Forwarding Agency.....	56
Cooling plants.....	56
Telephones and telegraphs.....	57
Real estate operations.....	57
Commissary Division.....	57
Purchases.....	58
Hotels.....	58
Mindi Dairy.....	59
Panama Line.....	59

SECTION III.—ADMINISTRATION

Departments.....	60
Operation and maintenance.....	60
Supply.....	60
Accounting.....	60
Executive.....	61
Health.....	61
Panama Railroad Co.....	61
Changes in administrative personnel.....	61
Changes in administrative organization.....	62
Personnel administration.....	62
Employees.....	62
Gold employees.....	63
Recruiting and turn-over of force.....	64
Wage adjustments.....	66
Silver employees.....	66
Silver wages.....	67
Silver eligibility and employment program.....	67
Repatriations.....	68
Cash relief for disabled employees.....	68
Experiment gardens.....	69

TABLE OF CONTENTS

V

	Page
Clubhouses and playgrounds.....	70
Clubhouse subdivision.....	70
Subdivision of playgrounds.....	71
Legislation.....	72
Capital allotments, fiscal year 1941.....	74
General program.....	76
Additional needs.....	77
Third Locks project.....	78
Panama Canal Twenty-fifth Anniversary.....	79

SECTION IV.—GOVERNMENT

Area of the Canal Zone.....	80
Population.....	80
Public Health.....	81
Vital statistics.....	81
Malaria.....	82
Hospitals.....	83
Quarantine and immigration.....	83
Municipal engineering.....	85
Testing laboratory.....	85
Water system.....	85
Sewer system.....	86
Roads, streets, and sidewalks.....	86
Townsite development.....	86
Cities of Colon and Panama.....	87
Miscellaneous projects.....	87
Public order.....	88
Fire protection.....	90
Colon fire.....	91
Magistrates' courts.....	91
Balboa.....	91
Cristobal.....	92
Pardons and reprieves.....	92
Public school system.....	92
Postal system.....	93
Air mail.....	95
Inmigration visas.....	96
Relations with Panama.....	96
Customs.....	97
Shipping commissioner.....	98
Administration of estates.....	98
Licenses and taxes.....	98
Foreign corporations.....	99
Insurance.....	99
Commercial aviation.....	99

SECTION V.—FINANCIAL AND STATISTICAL STATEMENTS

Accounting system.....	101
Operations of the Panama Railroad Co.....	102
Panama Canal operations.....	102
Index to tables.....	103
Financial tables.....	104

REPORTS OF HEADS OF DEPARTMENTS AND DIVISIONS

APPENDIXES NOT PRINTED

The material in the annual report of the Governor of the Panama Canal, published in this volume, is to a large extent a summary of the data presented in the annual reports from the heads of departments and divisions in the Canal organization; the latter, regarded as appendixes to the report of the Governor, are not printed. The annual reports of the Panama Railroad Co. and the health department are published separately; the latter is compiled for calendar years only. The reports of the heads of departments and divisions, as listed below, are on file at the Washington office of the Panama Canal or at the office of the Governor at Balboa Heights, Canal Zone:

Engineer of maintenance, report of.

Special construction division, report of supervising engineer.

Special engineering division, report of designing engineer.

Dredging division, report of superintendent.

Plans section, report of acting chief.

Real estate section, report of acting chief.

Assistant engineer of maintenance, report of.

Electrical division, report of electrical engineer.

Municipal engineering division, report of acting municipal engineer.

Locks division, report of superintendent.

Office engineer, report of.

Section of meteorology and hydrography, report of.

Marine division, report of marine superintendent.

Mechanical division, report of superintendent.

Supply department, report of chief quartermaster.

Accounting department, report of comptroller.

Executive department:

Division of civil affairs, report of chief.

Police and fire division, report of chief.

Division of schools, report of acting superintendent.

Bureau of clubs and playgrounds, report of general secretary.

Division of personnel supervision and management, report of acting director of personnel.

Surveying officer, report of.

General counsel, report of.

Public defender, report of.

Paymaster, report of.

Magistrates' courts:

Magistrate, Cristobal, report of.

Magistrate, Balboa, report of.

Washington office, report of chief of office and general purchasing officer.

Pardon board, report of chairman.

Senior aeronautical inspector, report of.

ANNUAL REPORT
OF THE
GOVERNOR OF THE PANAMA CANAL

BALBOA HEIGHTS, CANAL ZONE,
October 25, 1940.

THE SECRETARY OF WAR,
Washington, D. C.

SIR: I have the honor to submit the report of the Governor of the Panama Canal for the fiscal year ended June 30, 1940.

On July 11, 1940, the undersigned took oath of office as Governor of the Panama Canal succeeding Brigadier General Clarence S. Ridley, U. S. Army, who resigned July 10, 1940.

Respectfully,

GLEN E. EDGERTON, *Governor.*

INTRODUCTION

The administration of the affairs of the Panama Canal enterprises involves three main elements—(a) the operation and maintenance of the Canal itself; (b) the operation of the auxiliary enterprises necessary to provide adequately for the needs of shipping and of the Canal operating forces; and (c) the government of the Canal Zone, populated by American civilians, native or tropical workers and their families, and by the United States Army and Navy defense forces.

The immediate supervision of the administration of these various activities rests with the heads of the nine major departments and divisions reporting to the Governor, in whom is centered responsibility and control of the entire organization either in his capacity as Governor of the Panama Canal or as president of the Panama Railroad Co., an adjunct of the Canal enterprise, organized as a Government-owned corporation.

By Executive Order of September 5, 1939, the provisions of Section 13 of the Panama Canal Act, approved August 24, 1912, were invoked as an emergency measure and since that date the Commanding General, Panama Canal Department, United States Army, has exercised final authority and jurisdiction over the operation of the Panama Canal and all its adjuncts, appendants, and appurtenances, including control and government of the Canal Zone; and the Governor of the Panama Canal has been subject to that authority and the orders issued under it.

OPERATION AND MAINTENANCE OF THE CANAL

The primary function of the Panama Canal is to provide and maintain a waterway by means of which vessels may make the transit from one ocean to the other, and to handle such traffic as presents itself for transit with a maximum of safety and a minimum of delay. Essentially this involves the maintenance of the waterway, the operation of the locks, and the control of traffic through the Canal. Throughout the year the Canal force maintained its high standard of expeditious service not only in the actual transiting of ships but in providing emergency repairs, fuel, supplies, and the various supplementary services incidental to shipping. There were no interruptions to traffic during the year.

OPERATION OF AUXILIARY ENTERPRISES—BUSINESS OPERATIONS

Secondary only to the operation of the Canal is the function of supplying various services to shipping. Commerce requires at the Canal certain adjuncts essential to shipping, such as fuel oil and coaling plants, storehouses for foodstuffs, ship chandlery, and other essential supplies, marine and railway repair shops, terminal facilities for the transshipment of cargo and passengers, a railroad line across the Isthmus and a steamship line between New York and Panama, quarters and commissaries for the operating force, and other adjuncts essential to the economical and efficient operation of the Canal. These services, under coordinated and centralized control, are provided by the various business units of the Panama Canal and Panama Railroad Co. The coordination of such services with the transit of ships through the Canal assists materially in the efficient and economical operation of the waterway. Moreover, in providing marine repair facilities, fuel, and other supplies, the operation of these business units promotes traffic through the Canal.

GOVERNMENT—ADMINISTRATION

The usual functions of government, such as schools, police and fire protection, quarantine, public health, immigration service, posts, customs, aids to navigation, steamboat inspection, hydrographic and meteorological work, water supply, sewers, construction and maintenance of streets, and similar activities, which, in the United States are directed by various officers of the national, State, and municipal governments, are entrusted in the Canal Zone to the Governor, and are executed under his authority and responsibility. This centralization of all governmental activities under one head is essential to economical and efficient administration.

SERVICES RENDERED BY THE CANAL TO SHIPPING

The more important items of the business of the Canal and its adjuncts covering principal services to shipping are expressed numerically in the following table, which presents a comparison of the activities during the fiscal year 1940 with the 2 years immediately preceding:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Transits of Canal by ocean-going vessels paying tolls.....	5,370	5,903	5,524
Transits of small commercial traffic not counted in ocean-going traffic.....	973	914	931
Free transits of U. S. Army and Navy vessels, Colombian Government vessels, vessels for repairs, etc.....	602	664	476
Total transits.....	6,945	7,481	6,931
Number of lockages during year:			
Gatun Locks.....	5,302	6,054	5,651
Pedro Miguel Locks.....	5,392	6,283	5,870
Miraflores Locks.....	5,286	6,221	5,813
Tolls levied on ocean vessels.....	\$21,144,675.36	\$23,661,021.08	\$23,169,888.70
Tolls on small commercial vessels.....	33,084.46	38,408.94	45,318.69
Total tolls.....	\$21,177,759.82	\$23,699,430.02	\$23,215,207.39
Cargo passing through Canal (tons).....	27,299,016	27,866,627	27,385,924
Net tonnage (Panama Canal measurement) of transiting ocean vessels.....	24,144,366	27,170,007	25,950,383
Cargo per Panama Canal net ton of ocean vessels, laden vessels only.....	1,326	1,238	1,225
Average tolls per ton of cargo, laden vessels only.....	\$0.632	\$0.727	\$0.750
Calls at Canal ports by ships not transiting Canal.....	890	831	865
Cargo handled and transferred at ports (tons).....	2,062,020	1,580,859	1,530,287
Coal, sales and issues (tons).....	118,219	70,487	103,844
Coal, number of commercial ships bunkered.....	300	276	312
Fuel oil pumped (barrels).....	12,492,347	9,037,955	7,487,667
Fuel oil—number of ships served other than vessels operated by the Panama Canal.....	2,455	2,063	1,903
Ships repaired, other than Panama Canal equipment.....	779	587	633
Ships drydocked, other than Panama Canal equipment.....	119	119	106
Provisions sold to commercial ships (commissary sales).....	\$297,477.96	\$307,342.16	\$327,943.72
Chandlery sold to ships (storehouse sales).....	\$67,559.67	\$45,785.68	\$61,213.12

NET REVENUES

The net revenues from Canal operations proper were \$11,253,773.49 as compared with \$13,841,071.19 last year. Net revenues from business operations under the Panama Canal for 1940 were \$1,033,-886.06 as compared with \$681,272.48 in 1939. The combined net revenues accruing from the Canal and its business units totaled \$12,287,659.55, as compared with \$14,522,343.67 in 1939.

The gross capital investment as of the beginning of the fiscal year was \$543,150,444.95 and the net investment, \$508,107,922.04. Net revenue for the year 1940 produced a return of 2.42 percent on this net investment as against 2.86 for the previous year.

The foregoing figures do not include the Isthmian operations carried on by the Panama Railroad Co., which yielded a net profit of \$2,497,072.70 for the year, as compared with \$1,481,847.10 for the previous fiscal year, an increase of \$1,015,225.60 or 68.5 percent.

REPLACEMENTS

The past fiscal year marked the close of 26 years of successful operation of the Panama Canal; in fact, its dependable and efficient service is now taken for granted.

One of the factors which has made this possible is the high state of maintenance in which all wearing and deteriorating parts are kept. Of the total capital value of the Panama Canal there are approximately \$100,000,000 of general structural values pertaining to nonbusiness units of the organization, which are subject to deterioration and require regular repair and periodical replacement.

Some of these structures, such as dams and concrete buildings, are still in excellent condition and require but little expenditure for upkeep; but on others deterioration has reached a point where replacement should not longer be deferred. These necessary replacements include not only the frame buildings originally erected to serve during the period of the construction of the Canal, but also docks, highways, etc., which, due to ordinary deterioration or other conditions, have been rendered inadequate or unserviceable for present requirements or uneconomical to maintain.

Funds for the replacement of worn-out plant and equipment for these nonbusiness units (with the exception of floating plant) must be appropriated for by Congress from the general funds of the Treasury, since no funded replacement reserves for these operations are maintained by the Panama Canal. However, in the Canal accounts depreciation charges are made on depreciable property, but the funds covering depreciation charges for nonbusiness units are turned in to the general fund of the Treasury each year and are not available without appropriation. Thus, for this part of the organization, the Panama Canal depends on Congress to provide from these funds (which have been deposited annually in the Treasury in prior years) the necessary replacement of worn-out and obsolete plant to maintain the enterprise up to the standard of operation.

Not only is there demand for replacement of some of the existing facilities but also the need develops for new kinds of facilities. Funds for such new facilities must also be obtained by direct appropriation.

For these reasons, it is essential to the continued efficiency of the Canal and to the growth of its facilities to meet the growing demands, that the Bureau of the Budget and the Congress give careful consideration to the requirements submitted annually by the Governor for these purposes.

SECTION I

CANAL OPERATION AND TRADE VIA THE PANAMA CANAL

STATISTICS OF CANAL TRAFFIC

Transits of ocean-going commercial vessels ¹ through the Panama Canal in 1940 numbered 5,370, in comparison with 5,903 in the previous fiscal year, a decrease of 533, or 9 percent. Although closely approximating the 1936 and 1937 totals, which were 5,382 and 5,387 transits, respectively, the number of transits was the lowest since 1935 when 5,180 vessels passed through the Canal.

Tolls on the 5,370 transits totaled \$21,144,675.36, in comparison with \$23,661,021.08 in 1939, a decrease of \$2,516,345.72, or 10.6 percent.

Cargo carried by these vessels amounted to 27,299,016 tons in 1940, in comparison with 27,866,627 tons in 1939, a decline of 567,611 tons, or 2.0 percent. Panama Canal net tonnage of these ships aggregated 24,144,366 tons in 1940 in comparison with 27,170,007 in the previous year, a decrease of 3,025,641 tons, or 11.1 percent. The relatively smaller decrease in cargo tonnage is attributable to the fact that the average vessel passing through the Canal in 1940 was more heavily loaded and that fewer vessels made the transit in ballast.

A brief review of traffic from the opening of the Canal on August 15, 1914, indicates that starting with a total of 1,058 transits in the fiscal year 1915 there was a gradual growth of traffic which reached a total of 6,289 transits in the fiscal year 1929. The fiscal year 1929 may be considered the record year in Canal traffic with a total of 6,289 transits (an average of 17.2 transits per day), total tolls of \$27,111,125, and total cargo carried through the Canal of 30,647,768 tons, although the Panama Canal net tonnage of 27,585,000 (estimated in accordance with the present rules of measurement which became effective March 1, 1938) of the ships in the fiscal year 1929 was slightly exceeded the following year (fiscal year 1930) when the Panama Canal net tonnage was 27,716,000 (estimated in accordance with the present rules). From these record levels the world-wide depression reduced Canal traffic during the next four years so that transits numbered only 4,162 in the fiscal year ended June 30, 1933. From that point traffic gradually increased, reflecting the upswing in business conditions, with the result that in 1939 transits were but 6 percent fewer than in the record year of 1929. During the early part

¹ Includes all tolls-paying vessels having a measurement of 300 or more net tons (Panama Canal measurement) or 500 or more displacement tons.

of the fiscal year 1940 hostilities broke out in Europe. This had an almost immediate effect upon Canal traffic through disrupted schedules and sailings, notably in the normally important trades between Europe and the west coasts of North and South America.

The following table shows a comparison of traffic in the fiscal years 1940 and 1929, and the percentage of the 1940 traffic to the peak traffic of 1929:

	Number of transits	Panama Canal net tonnage	Tolls	Tons of cargo
Fiscal year 1929.....	6, 280	27, 585, 000	\$27, 111, 125	30, 647, 768
Fiscal year 1940.....	5, 370	24, 144, 366	\$21, 144, 675	27, 299, 016
Percentage of traffic (1940÷1929).....	85. 4	87. 5	78. 0	89. 1

The combined cargo movement through the Canal in 1940 showed a slight decrease (2 percent) in comparison with the previous year. The decline in cargo tonnage was caused by a considerable decrease in the volume of cargo moving from the Pacific to the Atlantic since the movement in the opposite direction increased from 9,011,267 tons in 1939 to 9,819,600 tons in 1940, a gain of 9 percent. The movement of cargo from the Atlantic to the Pacific was less affected by the war in Europe than that moving from the Pacific to the Atlantic, because under pre-war conditions a large proportion of the cargoes moving from the Atlantic to the Pacific originated in the United States and other sources in the Western Hemisphere. On the other hand, the movement in the other direction has been adversely affected by the sharp curtailment in the shipment of a number of important bulk commodities normally shipped from North and South America to Europe (wheat, lumber, nitrates, mineral oils, etc.).

As previously stated, the greatest factor contributing to the decline in transits was fewer sailings in the Europe-North America and Europe-South America trades. In the former, which normally ranks second to the United States intercoastal trade in the number of transits, traffic declined from 1,341 transits in 1939 to 747 in 1940, a decrease of 594, or 44 percent, while the amount of cargo passing between these two areas declined from 5,306,000 tons in 1939 to 3,343,000 tons in 1940, a decrease of 1,963,000 tons, or 37 percent. In the Europe-South America trade there were 235 fewer transits than in the preceding year, a decline of 40 percent, while the amount of cargo transported over this route in 1940, amounting to 1,735,000 tons, was 40 percent under the 2,897,000 tons passing through in 1939. The decline in the foregoing two trades was offset in part, however, by increases in some of the other important trades, notably that between the east coast of the United States and the west coast of South America, which increased 27 percent in transits and 23 percent in cargo tonnage over 1939. The volume of goods moving in this trade

(amounting to 3,259,000 tons in 1940; 502,000 tons south-bound and 2,757,000 tons north-bound) was greatly stimulated by reason of the interruption of the normal flow of trade between Europe and South American countries following the outbreak of the European war. The volume of south-bound cargo moving over this trade route was greater by 160 percent than in the preceding year, the increase being made up of larger shipments of coal and of various manufactured goods, with coal shipments aggregating 140,000 tons as compared with 2,000 tons in 1939. The north-bound tonnage in this trade—2,757,000 tons—was 310,000 tons, or 12.7 percent, greater than in 1939. Shipments of both copper metal and copper ores with tonnages of 264,000 and 58,000 tons, respectively, increased materially in comparison with 1939, while shipments of iron ore aggregating 1,567,000 tons were slightly under 1939; nitrate shipments, amounting to 599,000 tons, increased about 10 percent over 1939.

Traffic in the United States-Far East trade (including the Philippine Islands) also increased substantially in comparison with 1939. Transits numbering 661, showed an increase of 84, or 15 percent, over the number passing over this route in 1939, while cargo tonnage, totaling 4,864,000 tons, was greater by 794,000 tons, or 20 percent, than in the previous year. Of the total cargo moving between these two areas in 1940, 3,266,000 tons, or 67 percent, was west-bound and 1,598,000 tons, or 33 percent, moved east-bound. In the west-bound movement, which was up 395,000 tons, or 14 percent, over 1939, large increases occurred in shipments of mineral oils, phosphates, raw cotton, and manufactures of iron and steel; scrap metal shipments in this trade, totaling 948,000 tons in 1940, were 206,000 tons less than in 1939. Of the cargo moving east-bound (i. e., imports by the United States of cargoes originating on the other side of the Pacific Ocean), shipments through the Canal of raw rubber, totaling 184,000 tons, were more than eight times the volume of such shipments in 1939. Increases were also recorded in shipments of chrome ore and vegetable oils, while shipments of sugar, totaling some 622,000 tons, although still the most important east-bound movement in this trade, declined by 7.0 percent.

In the United States intercoastal trade, which for many years has been the most important trade route served by the Canal, a total of 7,714,000 tons of cargo passed through the Canal, an increase of 830,000 tons, or 12 percent over the preceding year. Cargo tonnage over this route increased in both directions. From the Atlantic to the Pacific, shipments totaled 2,796,000 tons in 1940, an increase of 404,000 tons, or 17 percent, while shipments in the opposite direction aggregated 4,919,000 tons, an increase of 425,000 tons, or 9 percent. In the west-bound movement shipments of manufactures of iron and steel increased from 784,000 tons in 1939 to 1,048,000 tons in 1940, a gain

of 34 percent, while in the opposite direction shipments of lumber increased 359,000 tons, or 24 percent, over the 1,521,000 tons of this product passing through in 1939; and mineral oils, totaling 892,000 tons, increased 8 percent over 1939.

In other principal trades there was an increase in cargo tonnage moving between the United States and the Hawaiian Islands and between the United States and Australasia. Tonnage moving in the former route totaled 504,000 tons in 1939 in comparison with 695,000 tons in 1940, an increase of 191,000 tons or 38 percent. In this trade shipments of manufactures of iron and steel to Hawaii increased from 21,000 tons in 1939 to 37,000 tons in 1940, a gain of 76 percent, and shipments of tin-plate increased from 40,000 tons in 1939 to 49,000 tons in 1940, a gain of 23 percent. Shipments of sugar from the Hawaiian Islands to the United States totaled 309,000 tons, an increase of 49 percent over 1939, while the movement of canned fruits and fruit juices in this direction increased from 130,000 tons in 1939 to 173,000 tons in 1940, a gain of 33 percent. The cargo tonnage moving between the United States and Australasia increased from 462,000 tons in 1939 to 624,000 tons in 1940, an increase of 162,000 tons, or 35 percent. The increase in this cargo movement was due primarily to increased sulphur shipments in the west-bound trade which showed an increase of 67,000 tons in 1940 over 1939, a gain of 70 percent, while in the opposite direction shipments of chrome ore showed a gain of 28,000 tons as compared with 1939.

Cargo tonnage between Europe and Australasia through the Panama Canal declined 13 percent in 1940 as compared with 1939. This decrease is accounted for in the south-bound shipments which declined 275,000 tons, or approximately 51 percent in volume. This was occasioned by the lesser shipments of iron and steel manufactures which decreased 71,000 tons in 1940 in comparison with 1939, while shipments of automobiles and parts and other machinery also were much lighter than in 1939. On the other hand, the north-bound movement of cargo in this trade showed a small increase in 1940 over 1939 (13 percent). This was due chiefly to the heavier shipments of food products in cold storage, such as dairy products and meats which increased by 105,000 tons or 33 percent over last year, and to wool shipments which increased 44,000 tons as compared with 1939.

Further details of the individual commodities and of the trade routes served by the Canal are presented on pages 14 to 21 of this report.

In the fiscal year 1940, transits of local commercial vessels under 300 net tons, Panama Canal measurement, numbered 973, on which tolls of \$33,084.46 were paid. Transits of naval and other public vessels of the United States, war vessels of the Colombian Government, and vessels transiting solely for repairs, none of which paid

tolls, numbered 594 as against 664 for 1939. Further details on vessels transiting free of tolls are shown on pages 13 and 14 of this report. The total of all tolls-paying and free transits combined numbered 6,937, in comparison with 7,481 in 1939, equivalent to averages of 18.95 and 20.50 transits per day, respectively.

The receipts from tolls as reported to the United States Treasury for the fiscal year 1940 were \$21,177,243.04. This figure includes tolls on local commercial traffic amounting to \$33,084.46, which are not included in the Canal statistics covering ocean-going commercial traffic. The toll receipts reported to the United States Treasury moreover reflect minor adjustments for overcharges and undercollections amounting to \$516.78. These two items account for the difference of \$32,567.68 between the toll receipts reported to the Treasury and the figure for tolls levied on ocean-going commercial traffic as reported in the following studies of traffic which are based on tolls levied at the time of transit.

CANAL TRAFFIC BY FISCAL YEARS 1915 TO 1940

Comparative traffic statistics covering ocean-going vessels for each fiscal year since the Canal was opened to navigation are shown in the table following:

Fiscal year ended June 30—	Number of transits	Panama Canal net tonnage ³	Tolls	Tons of cargo
1915 ¹	1,058	3,507,000	\$4,366,747.13	4,888,400
1916 ²	724	2,212,000	2,403,089.40	3,093,335
1917.....	1,738	5,357,000	5,620,799.83	7,054,720
1918.....	1,989	6,072,000	6,428,780.26	7,525,768
1919.....	1,948	5,658,000	6,164,290.79	6,910,097
1920.....	2,393	7,898,000	8,507,938.68	9,372,374
1921.....	2,791	10,550,000	11,268,681.46	11,595,971
1922.....	2,665	10,556,000	11,191,828.56	10,882,607
1923.....	3,908	17,206,000	17,504,027.19	19,566,429
1924.....	5,158	24,181,000	24,284,659.92	26,993,167
1925.....	4,592	21,134,000	21,393,718.01	23,956,549
1926.....	5,087	22,906,000	22,919,931.89	26,030,016
1927.....	5,293	24,245,000	24,212,250.61	27,733,555
1928.....	6,253	27,229,000	26,922,200.75	29,615,651
1929.....	6,289	27,585,000	27,111,125.47	30,647,768
1930.....	6,027	27,716,000	27,059,998.94	30,018,429
1931.....	5,370	25,690,000	24,624,599.76	25,065,283
1932.....	4,362	21,842,000	20,694,704.61	19,798,986
1933.....	4,162	21,094,000	19,601,077.17	18,161,165
1934.....	5,234	26,410,000	24,047,183.44	24,704,009
1935.....	5,180	25,720,000	23,307,062.93	25,309,527
1936.....	5,382	26,923,000	23,479,114.21	26,505,943
1937.....	5,387	25,430,000	23,102,137.12	28,108,375
1938.....	5,524	25,950,383	23,169,888.70	27,385,924
1939.....	5,903	27,170,007	23,661,021.08	27,866,627
1940.....	5,370	24,144,366	21,144,675.36	27,299,016
Total.....	109,787	493,385,756	474,191,533.27	526,089,691

¹ Canal opened to traffic Aug. 15, 1914.

² Canal closed to traffic approximately 7 months of fiscal year by slides.

³ Panama Canal net tonnage prior to 1939 are estimated figures based on revised measurement rules which became effective Mar. 1, 1938.

TRAFFIC BY MONTHS—FISCAL YEARS 1940 AND 1939

The ocean-going commercial traffic during each month of the fiscal year 1940 is summarized in the following table, in which are inserted for comparison corresponding figures for the preceding year:

Month	Number of transits		Panama Canal net tonnage		Tons of cargo		Tolls	
	1939-40	1938-39	1939-40	1938-39	1939-40	1938-39	1939-40	1938-39
July	485	429	2,254,398	1,933,816	2,317,697	2,025,660	\$1,974,380.72	\$1,694,205.00
August	490	468	2,247,009	2,177,699	2,385,039	2,171,674	1,964,776.48	1,890,050.74
September	457	438	2,119,418	2,005,241	2,415,700	1,998,464	1,855,574.22	1,741,895.46
October	458	494	2,068,665	2,276,194	2,386,314	2,359,673	1,815,210.24	1,977,706.76
November	489	505	2,178,556	2,302,333	2,472,503	2,223,830	1,915,075.38	1,984,014.72
December	489	509	2,116,424	2,336,011	2,361,176	2,374,395	1,840,096.98	2,031,017.04
January	466	525	2,056,638	2,380,916	2,337,943	2,393,390	1,795,241.88	2,062,454.16
February	402	501	1,782,977	2,282,318	2,123,574	2,206,963	1,567,416.06	1,996,735.66
March	470	553	2,099,902	2,586,580	2,279,432	2,664,068	1,832,416.98	2,252,156.28
April	376	496	1,704,951	2,278,326	2,081,483	2,472,504	1,508,200.86	1,969,851.16
May	419	506	1,871,095	2,341,894	2,319,372	2,538,949	1,648,035.78	2,053,502.16
June	369	479	1,644,313	2,268,679	1,788,783	2,437,087	1,428,249.78	1,977,431.94
Total	5,370	5,903	24,144,366	27,170,007	27,299,016	27,806,627	21,144,675.36	23,661,021.08
Average per month..	448	492	2,012,031	2,264,167	2,274,918	2,322,219	1,762,056.21	1,971,751.76

TANKER TRAFFIC

During the past 18 years tanker traffic has at times been one of the most important features of shipping through the Canal. The peak of tanker traffic occurred in the fiscal year 1924, when an average of 4.7 tankers per day passed through the Panama Canal. For many years thereafter tanker traffic comprised between 20 percent and 40 percent of the total Canal traffic. The most important phase of this tanker traffic has been the shipment of mineral oils from the California oil fields to the east coast of the United States. While the United States intercoastal trade still constitutes the most important movement of tanker traffic through the Canal, during the past year it accounted for only 180 (a daily average of only 0.5 transits) out of the total 495 tanker transits. Other tanker shipments are principally from the oil fields in the West Indies and in Peru.

Tanker traffic in the fiscal year 1940 was the lowest it has been in any fiscal year since 1923, the first year for which segregated statistics on tankers were compiled. Tankers accounted for only 11.4 percent of the total net tonnage, Panama Canal measurement, put through the Canal during the past year and for only 10.8 percent of the total tolls received. The two tables below show the traffic divided between tank ships and all other ocean-going commercial vessels, classified herein as "all other."

Number and daily average transits of tankers and all other carriers

Fiscal year	Ocean-going commercial transits			Daily average		
	Tankers	All other	Total	Tankers	All other	Total
1923	913	2,995	3,908	2.5	8.2	10.7
1924	1,704	3,454	5,158	4.7	9.4	14.1
1925	1,079	3,513	4,592	3.0	9.6	12.6
1926	1,090	3,997	5,087	3.0	11.0	14.0
1927	1,324	3,969	5,293	3.6	10.9	14.5
1928	1,121	5,132	6,253	3.0	14.0	17.0
1929	1,083	5,206	6,289	3.0	14.2	17.2
1930	1,218	4,809	6,027	3.3	13.2	16.5
1931	944	4,425	5,370	2.6	12.1	14.7
1932	612	3,750	4,362	1.7	10.2	11.9
1933	636	3,526	4,162	1.7	9.7	11.4
1934	942	4,292	5,234	2.6	11.7	14.3
1935	791	4,389	5,180	2.2	12.0	14.2
1936	598	4,784	5,382	1.6	13.1	14.7
1937	643	4,744	5,387	1.8	13.0	14.8
1938	562	4,962	5,524	1.5	13.6	15.1
1939	580	5,323	5,903	1.6	14.6	16.2
1940:						
July	48	437	485	1.5	14.1	15.6
August	51	439	490	1.6	14.2	15.8
September	46	411	457	1.5	13.7	15.2
October	41	414	455	1.4	13.4	14.8
November	59	430	489	2.0	14.3	16.3
December	44	445	489	1.4	14.4	15.8
January	44	422	466	1.4	13.6	15.0
February	37	365	402	1.3	12.6	13.9
March	34	436	470	1.1	14.1	15.2
April	26	350	376	.9	11.7	12.6
May	37	382	419	1.2	12.3	13.5
June	25	344	369	.8	11.5	12.3
Total	495	4,875	5,370	1.4	13.3	14.7

Panama Canal net tonnage and tolls of tankers and all other ocean-going commercial vessels

Fiscal year	Panama Canal net tonnage			Tolls paid by shipping using Canal		
	Tankers	All other	Total	Taukers	All other	Total
1923	5,326,000	11,880,000	17,206,000	\$4,769,324.63	\$12,734,702.56	\$17,504,027.19
1924	10,120,000	14,061,000	24,181,000	9,071,835.65	15,212,824.27	24,284,659.92
1925	6,307,000	14,767,000	21,134,000	5,728,302.26	15,665,415.75	21,393,718.01
1926	6,286,000	16,620,000	22,906,000	5,626,167.93	17,293,763.96	22,919,931.89
1927	7,555,000	16,690,000	24,245,000	6,658,806.90	17,553,433.71	24,212,250.61
1928	6,188,000	21,041,000	27,229,000	5,436,437.16	21,485,763.59	26,922,200.75
1929	5,792,000	21,793,000	27,585,000	5,145,632.19	21,965,493.28	27,111,125.47
1930	6,505,000	21,211,000	27,716,000	5,768,963.28	21,291,035.66	27,059,998.94
1931	5,237,000	20,453,000	25,690,000	4,682,320.14	19,942,279.62	24,624,599.76
1932	3,538,000	18,304,000	21,842,000	3,197,136.29	17,497,568.32	20,694,704.61
1933	3,775,000	17,319,000	21,094,000	3,393,311.02	16,207,766.15	19,601,077.17
1934	5,760,000	20,650,000	26,410,000	5,161,757.40	18,885,366.04	24,047,123.44
1935	4,635,000	21,085,000	25,720,000	4,192,863.09	19,114,199.84	23,307,062.93
1936	3,456,000	22,467,000	25,923,000	3,192,498.46	20,286,615.75	23,479,114.21
1937	3,714,000	21,716,000	25,430,000	3,451,771.65	19,650,365.47	23,102,137.12
1938	3,190,033	22,760,350	25,950,383	2,846,711.79	20,323,176.91	23,169,888.70
1939	3,361,367	23,808,640	27,170,007	2,766,289.86	20,894,731.22	23,661,021.08
1940	2,756,437	21,387,929	24,144,366	2,273,539.32	18,871,136.04	21,144,675.36

NATIONALITY OF VESSELS TRANSITING CANAL

Segregation of the ocean-going traffic through the Canal during the fiscal year 1940, by nationality, is presented in the following table which shows transits, measurement tonnage, tolls, and tons of cargo:

Ocean-going commercial traffic¹ through the Panama Canal during the fiscal year 1940, by nationality of vessels

Nationality	Number of transits	Measured tonnage			Tolls	Tons of cargo
		Panama Canal net	Registered gross	Registered net		
Argentine.....	1				\$3,977.00	-----
British.....	1,073	5,773,030	7,183,615	4,366,324	5,023,216.18	5,182,351
Chilean.....	38	172,172	253,392	150,242	154,265.22	121,571
Colombian.....	19	8,588	11,533	7,999	7,322.40	9,041
Danish.....	174	628,164	696,397	421,865	557,805.42	695,884
Egyptian.....	7	28,201	33,491	22,954	23,195.34	29,224
Finnish.....	3	9,351	11,340	6,515	8,038.44	12,640
French.....	93	378,366	504,354	280,558	335,518.56	341,366
German.....	55	217,902	271,213	157,326	196,040.34	229,495
Greek.....	175	785,614	919,087	564,231	670,334.04	994,836
Honduran.....	81	127,256	218,226	122,484	108,846.54	70,710
Hungarian.....	1	3,932	4,323	2,737	3,538.80	7,028
Italian.....	46	319,390	509,098	302,694	286,021.80	171,512
Japanese.....	272	1,600,295	2,162,006	1,309,213	1,432,980.00	1,863,619
Latvian.....	7	22,237	29,012	17,632	20,013.30	43,043
Mexican.....	4	1,483	2,518	1,687	2,934.70	1,897
Netherlands.....	340	626,638	737,918	422,451	551,890.08	617,948
Nicaraguan.....	7	2,583	4,361	2,436	2,258.28	4,106
Norwegian.....	557	2,537,264	2,932,868	1,754,229	2,177,121.60	2,905,772
Panamanian.....	243	463,965	660,181	384,081	333,076.98	513,708
Peruvian.....	6	10,344	15,598	9,716	9,191.88	9,341
Philippine.....	14	67,760	71,561	42,439	60,984.00	90,173
Rumanian.....	4	14,533	16,369	10,209	12,382.02	19,387
Soviet.....	9	13,807	18,058	10,572	15,243.80	18,278
Spanish.....	6	23,710	30,378	18,338	19,205.10	22,390
Swedish.....	110	503,639	1,011,211	472,258	431,678.52	791,083
United States.....	1,997	9,688,743	12,639,745	7,696,026	8,539,231.68	12,384,617
Uruguayan.....	1	1,231	1,782	1,120	886.32	-----
Yugoslavian.....	27	114,168	136,084	84,319	97,477.02	147,996
Totals:						
Fiscal year 1940.....	5,370	24,144,366	31,085,719	18,642,955	21,144,675.36	27,260,016
Fiscal year 1939.....	5,903	27,170,007	34,583,085	20,745,286	23,661,021.08	27,866,627
Fiscal year 1938.....	5,524	25,950,000	32,918,177	19,621,870	23,169,888.70	27,385,924

¹ Ocean-going commercial traffic includes only toll-paying vessels of 300 net tons and over, Panama Canal measurement, and vessels paying tolls on displacement tons of 500 displacement tons and over.

² Estimated tonnage under rules which became effective Mar. 1, 1938.

CARGO CARRIED BY VESSELS OF LEADING MARITIME NATIONS

Segregating the traffic through the Canal by nationality of vessels, the following table shows the aggregate cargo carried by ships of leading maritime nations during each of the past 5 years. For the fiscal year 1940 the percentage of total cargo carried by ships of each nationality is also shown:

Nationality	1940		Tons of cargo			
	Tons	Percent- age	1939	1938	1937	1936
United States.....	12,384,617	45.4	9,909,380	9,892,619	9,844,254	10,700,535
British.....	5,182,351	19.0	6,801,556	6,417,016	7,179,136	6,181,571
Norwegian.....	2,905,772	10.7	3,408,078	3,433,571	3,506,109	2,717,860
Japanese.....	1,863,619	6.8	1,710,303	1,877,502	1,789,178	1,697,880
Greek.....	994,836	3.6	666,471	525,351	429,913	238,310
Swedish.....	791,083	2.9	1,008,245	763,049	775,800	855,409
Danish.....	695,884	2.5	727,552	865,235	757,379	627,407
Netherland.....	617,948	2.3	675,105	749,642	700,725	511,620
Panamanian.....	513,708	1.9	371,721	415,561	627,182	654,610
French.....	341,366	1.2	501,752	567,288	542,539	544,343
German.....	229,495	.8	1,468,996	1,518,593	1,496,084	1,305,090
All remaining.....	778,337	2.9	617,468	360,497	460,076	471,308
Total.....	27,290,016	100.0	27,866,627	27,385,924	28,108,375	26,505,943

VESSELS PAYING TOLLS ON DISPLACEMENT TONNAGE

In the Canal traffic statistics, foreign naval vessels such as colliers, transports, supply ships, etc., with a measurement of 300 net tons (Panama Canal measurement) or more, and floating craft, such as vessels of war, dredges, etc., with a displacement measurement of 500 tons or more, are classified as ocean-going commercial vessels. Statistics on these vessels, except as relates to displacement tonnage, have been included in the traffic summaries shown on the preceding pages. As displacement tonnage cannot be combined with net tonnage, however, the following table shows statistics covering 24 vessels which transited the Canal during the fiscal year 1940 and paid tolls on displacement tonnage:

Nationality	Type of vessel	Number of transits	Displacement tonnage	Tolls
Argentine.....	Naval.....	1	7,954	\$3,977.00
British.....	do.....	17	94,538	47,269.00
Mexican.....	do.....	2	3,200	1,600.00
Netherland.....	do.....	1	999	499.50
Soviet.....	Dredge.....	3	5,635	2,817.50
Total.....	.....	24	112,326	56,163.00

VESSELS ENTITLED TO FREE TRANSIT

Naval and other vessels owned and operated in the Government service of the United States and Panama, war vessels of Colombia, and vessels transiting solely for the purpose of having repairs made at the Canal shops, are exempt from the payment of tolls, and such vessels are not included in the general transit statistics pertaining to Canal traffic.

The following shows the number of vessels in each group, the measured tonnage, the amount of tolls to which they would have been

subject at the prescribed rates if tolls had been charged against them, and the cargo carried by such vessels in ocean-to-ocean movement:

Class	Number of transits	Panama Canal net tonnage	Displacement tonnage	Tolls	Tons of cargo
U. S. Navy.....	255	154,065	307,580	\$288,562	75,260
U. S. Army.....	294	574,806	29,200	530,276	118,181
Other U. S. Government.....	24	2,574	35,622	20,128	2,113
Total, U. S. Government.....	573	731,535	372,402	838,966	195,554
Colombian Government.....	6	8,800	5,380	9,021	.....
Vessels transiting for repairs only.....	22	44,656	.....	32,168	.....
Others.....	1	12,008	.....	10,807	3,339
Grand total.....	602	796,999	377,782	890,967	198,893

SMALL COMMERCIAL VESSELS TRANSITING CANAL

Transits of small cargo-carrying vessels, and other small craft such as yachts, tugs, etc., of less than 300 net tons (Panama Canal measurement) or less than 500 tons, displacement measurement, are excluded from the statistics of ocean-going commercial traffic, although they are not exempt from the payment of tolls. The number of these small vessels transiting the Canal during the year, together with the tonnage, tolls, and the amount of cargo carried, is shown in the following table:

	Number of transits	Tonnage		Tolls	Tons of cargo
		Panama Canal net	Displacement		
Atlantic to Pacific.....	516	20,627	1,532	\$16,593.76	6,518
Pacific to Atlantic.....	457	18,633	.....	16,490.70	19,300
Total.....	973	39,260	1,532	33,084.46	25,818

CARGO SHIPMENTS SEGREGATED BY PRINCIPAL TRADE ROUTES

Cargo shipments through the Panama Canal during the fiscal year 1940 and in the 3 preceding years, segregated by principal trade routes, are shown in the following tabulation:

	Tons of cargo			
	1940	1939	1938	1937
United States Intercoastal:				
Atlantic to Pacific.....	2,795,708	2,391,523	2,341,847	2,575,075
Pacific to Atlantic.....	1,918,629	4,493,203	4,052,728	3,965,082
Total.....	7,714,337	6,884,726	6,394,575	6,540,157
United States and Far East (excluding Philippine Islands):				
Atlantic to Pacific.....	2,888,160	2,593,808	3,092,992	3,265,672
Pacific to Atlantic.....	585,304	280,593	433,544	662,047
Total.....	3,473,464	2,874,401	3,526,536	3,927,719

	Tons of cargo			
	1940	1939	1938	1937
East coast United States and west coast South America:				
Atlantic to Pacific.....	501, 511	192, 732	262, 207	208, 218
Pacific to Atlantic.....	2, 757, 412	2, 447, 257	2, 389, 649	2, 359, 431
Total.....	3, 258, 923	2, 639, 989	2, 651, 856	2, 567, 649
Europe and Canada:				
Atlantic to Pacific.....	44, 402	78, 789	98, 702	106, 296
Pacific to Atlantic.....	2, 006, 622	2, 539, 436	1, 716, 157	2, 467, 874
Total.....	2, 051, 024	2, 618, 225	1, 814, 859	2, 574, 170
Europe and South America:				
Atlantic to Pacific.....	259, 700	415, 697	453, 298	460, 777
Pacific to Atlantic.....	1, 474, 874	2, 481, 541	2, 520, 600	2, 661, 698
Total.....	1, 734, 574	2, 897, 238	2, 973, 898	3, 122, 475
United States and Philippine Islands:				
Atlantic to Pacific.....	378, 285	277, 399	217, 560	242, 612
Pacific to Atlantic.....	1, 012, 861	918, 937	1, 106, 130	783, 657
Total.....	1, 391, 146	1, 196, 336	1, 323, 690	1, 026, 269
Europe and United States:				
Atlantic to Pacific.....	192, 374	337, 401	449, 765	534, 749
Pacific to Atlantic.....	1, 099, 296	2, 349, 888	1, 972, 196	1, 435, 003
Total.....	1, 291, 670	2, 687, 289	2, 421, 961	1, 969, 752
Europe and Australasia:				
Atlantic to Pacific.....	268, 143	542, 770	545, 553	473, 333
Pacific to Atlantic.....	864, 701	759, 794	705, 917	670, 192
Total.....	1, 132, 844	1, 302, 564	1, 251, 470	1, 143, 525
United States and Hawaiian Islands:				
Atlantic to Pacific.....	189, 490	141, 804	151, 839	184, 517
Pacific to Atlantic.....	504, 674	361, 857	450, 000	506, 320
Total.....	694, 164	503, 661	601, 839	690, 837
United States and Australasia:				
Atlantic to Pacific.....	487, 896	374, 544	471, 299	316, 004
Pacific to Atlantic.....	135, 639	86, 999	157, 048	236, 259
Total.....	623, 535	461, 543	628, 347	552, 263
Miscellaneous routes and sailings:				
Atlantic to Pacific.....	1, 813, 931	1, 664, 800	1, 603, 498	1, 528, 379
Pacific to Atlantic.....	2, 119, 404	2, 135, 855	2, 193, 395	2, 465, 180
Total.....	3, 933, 335	3, 800, 655	3, 796, 893	3, 993, 559
Total traffic, all routes:				
Atlantic to Pacific.....	9, 819, 600	9, 011, 267	9, 688, 560	9, 895, 632
Pacific to Atlantic.....	17, 479, 416	18, 855, 360	17, 697, 364	18, 212, 743
Total.....	27, 299, 016	27, 866, 627	27, 385, 924	28, 108, 375

ORIGIN AND DESTINATION OF CARGO

The following tables show the origin and destination, by principal trade areas, of the cargoes carried by steamers passing through the Canal during the past fiscal year; one covers the movement of cargo from the Atlantic to the Pacific and the other from the Pacific to the Atlantic.

Origin and destination of cargo through the Panama Canal during 1940 from Atlantic to Pacific segregated by countries in principal trade areas

From--	To west coast, North America					To west coast, South America						
	United States	Canada	Central America and Mexico	Bahboa, C. Z.	Hawaiian Islands	Total	Chile	Colom-bia	Ecuador	Peru	South Amer-ica ²	Total
East coast, North America:												
United States:												
North Atlantic ports	Tons 2,063,698	Tons 7,706	Tons 36,881	Tons 6,210	Tons 120,669	Tons 2,253,221	Tons 313,138	Tons 42,578	Tons 19,811	Tons 100,351	Tons 15,645	Tons 491,523
South Atlantic ports	138,638	1,800	18,046		10,081	169,165						
Gulf ports	593,372	15,211	52,710	12,701	58,110	732,137			9,988			9,988
Total, United States	2,795,708	24,717	107,667	18,944	189,490	3,136,526	313,138	42,578	29,799	100,351	15,645	501,511
Canada	63,513	19,223				82,736				392		7,723
Central America and Mexico			54,072			54,072	7,432					7,432
Cristobal, C. Z.	22,258	880	50,116			73,254	19,041	70,321	27,362	13,330	55,583	185,640
West Indies	2,575	12,529	3,653	129,846	32	148,635	279,859	9,297	62	1,426	20,181	311,128
Total, North America	2,884,054	57,349	215,508	148,790	189,522	3,495,223	619,373	122,557	57,223	115,469	91,712	1,006,334
Europe:												
British Isles	47,318	34,385				81,703	100,232	2,494	4,194	23,630	10,490	141,050
Belgium	42,826	3,583	10,111	925		57,445	10,389	4,963	3,867	8,539	413	28,171
Denmark	3,131	80	34			3,245		1,885	2,100			3,985
France	11,280	3,408				15,168	2,285	42	190	1,181		3,698
Germany	2,981	113	10,413	99		13,606	11,172	2,504	1,970	7,506	419	23,571
Italy	7,398	650	8,727		16	16,791	4,969	556		3,000	117	8,612
Netherlands	9,645	664				10,309	2,230	612	640	4,286	1,375	9,163
Norway	11,150	146	5,993	1,839		19,128	2,931	333	769	1,655		5,988
Russia												
Spain and Portugal	26	1,013				1,069	127	6		13		146
Sweden	48,091	224	4,063	1,759	112	54,249	15,397	1,312	475	10,661	65	27,910
Europe ²	8,528	106	4,297			12,841	3,979	157		2,131	1,469	7,976
Total, Europe	192,374	44,402	44,028	4,622	128	285,554	153,711	14,861	14,225	62,692	14,298	259,700
East coast, South America												
Asia	117,928	6,897		2,902		127,727	37,922	25,037	75	4,294		67,328
Africa	389				14	403						
Africa (except Egypt)												
Egypt	3					3	974					974
Grand total	3,194,748	108,648	259,536	156,311	189,664	3,908,910	811,980	162,458	71,523	182,365	106,010	1,334,336
Percent of total west-bound cargo:												
1940	32.5	1.1	2.6	1.6	2.0	39.8	8.3	1.7	0.7	1.8	1.1	13.6
1939	32.2	1.1	2.9	1.6	1.7	39.7	6.9	1.6	0.6	2.6	1.1	12.1
1938	30.8	2.2	1.4	1.5	1.6	37.5	6.9	1.2		2.9	.1	12.0

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.

From—	To Australasia				To Asia				Grand total	Percent of total west-bound cargo		
	Australia	New Zealand	Australasia ²	Total	Philippine Islands	China	Japan	Far East ²		1940	1939	1938
East coast North America:												
United States:												
North Atlantic ports.....	Tons 212,756	Tons 46,988	Tons 259,744	Tons 333,029	Tons 309,534	Tons 309,534	Tons 1,109,997	Tons 236,705	Tons 4,975,755	50.7	43.2	45.1
South Atlantic ports.....	15,184		15,184	41,278	18,658	18,658	85,880	701	330,816	3.4	2.5	1.8
Gulf ports.....	139,222	73,746	212,968	3,978	3,978	137,107	939,733	29,895	2,685,806	21.2	21.3	21.2
Total, United States.....	367,162	120,734	487,896	378,285	378,285	465,299	2,155,560	267,301	7,392,378	75.3	67.0	68.1
Central America and Mexico.....	153,623	48,462	202,085	166	166	23,926	26,085	697	313,118	3.2	3.9	4.0
Cristobal Canal Zone ¹	17,164	11	17,175	17,164	17,164	13,645	40,772	7,000	139,985	1.4	1.3	1.5
West Indies.....	2,375	2,920	5,295	1	1	36	473	309	239,605	2.6	2.4	2.0
Total, North America.....	540,335	172,130	712,465	378,452	378,452	479,020	2,226,737	275,118	8,574,126	87.3	78.1	79.2
Europe:												
British Isles.....	1,000	234,476	12,735	248,211			1,790		472,754	4.8	8.0	7.1
Belgium.....		9,323	9,323	1,586		3	10,572		107,100	1.1	2.5	3.2
Denmark.....									7,230	.1		
France.....	23	12	10,203	10,238			309		29,107	.3	.6	.6
Germany.....		371				146			38,003	.4	3.0	3.1
Italy.....						11			25,444	.2	.2	.2
Netherlands.....						5,515	15,788	4,652	45,427	.4	.6	.9
Norway.....						2,719	27,255	691	55,643	.6	.5	.7
Russia.....							9,704	9,704	9,704	.1	.1	
Spain and Portugal.....						107	21,264	3,922	26,552	.3		
Sweden.....						1,990	14,383	696	100,085	1.0	.9	1.0
Europe ²						400	3,000		23,917	.3	.5	.4
Total, Europe.....	1,023	244,182	22,938	268,143	2,679	10,861	91,364	19,665	940,966	9.6	16.9	17.2
East coast, South America.....												
Asia.....									300,376	3.1	4.5	3.2
Africa (except Egypt).....									403		.4	.3
Egypt.....									977		.1	
Grand total.....	541,358	416,312	25,867	983,537	381,424	497,933	2,418,677	294,783	9,819,600	100.0	100.0	100.0
Percent of total west-bound cargo:												
1940.....	5.5	4.2	.3	10.0	3.9	5.1	24.6	3.0	36.6			
1939.....	4.9	7.8	.7	13.4	3.1	3.1	28.1	.5	34.8			
1938.....	6.4	7.2	.1	14.0	2.3	4.3	29.6	.3	36.5			

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.

Origin and destination of cargo through the Panama Canal during 1940 from Pacific to Atlantic segregated by countries in principal trade areas

From—	To United States			To other North America				To Europe				
	North Atlantic ports	South Atlantic ports	Gulf ports	Total	Canada	Central America and Mexico	Cristobal, Canal Zone ¹	West Indies	Total, North America	British Isles	Belgium	Denmark
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
West coast, North America:												
United States	4,275,974	273,889	368,766	4,918,629	3,597		95,969	560,119	5,578,344	714,773	92,490	16,570
Canada	128,437		25,029	153,466	26,893		1,485	22,593	294,437	1,852,124	12,397	1,102
Bahama, Canal Zone ¹			2,600	2,600					2,600	451		
Central America and Mexico	17,757		18,480	36,237		1,050	34,500		71,787	60		998
Hawaiian Islands	461,080		40,594	501,674					504,674	42,100	190	9
Total, North America	4,886,248	273,889	455,469	5,615,606	30,490	1,050	131,984	582,712	6,361,842	2,609,568	105,077	18,679
West coast, South America:												
Chile	2,087,527	274,744	165,413	2,527,684	4,994	3,546	37,139	28,793	2,602,156	169,642	31,802	16,067
Colombia	23,955			23,955			97,432		121,387		10	4
Ecuador	38,468			38,468			36,558	128	74,954	44,011		531
Peru	156,923	3,861	6,169	166,956	14,987		13,000	62,895	257,838	241,280	18,751	31,285
South America ²	349			349			77		426	86	50	
Total, South America	2,307,222	278,608	171,582	2,757,412	19,981	3,546	184,006	91,816	3,056,761	455,058	50,613	47,887
Australasia:												
Australia	84,563			84,563	126,728		1,372	16,223	228,886	62,325		
New Zealand	13,906			13,906	7,892		233	386	22,417	595,886		
Australasia ²	37,170			37,170	25		30	570	37,795	137,130		
Total, Australasia	135,639			135,639	134,045		1,635	17,179	289,098	795,331		
Asia:												
Philippine Islands	920,609	1,834	90,418	1,012,861			1,852	307	1,015,020			
China	110,133	516	1,597	112,246	18	6,806	8,999	254	128,623	18,349	4,299	7,565
Japan	192,695	2,083	11,432	206,210	360	500	19,559	3,396	230,125	39,298	4,082	
Far East ²	255,293	40	8,215	269,548	46		2,522	40,368	309,484	8,838		8,200
Total, Asia	1,482,030	4,473	111,662	1,598,165	424	7,300	33,032	44,325	1,683,252	69,485	8,381	15,765
Grand total	8,811,139	556,970	738,713	10,106,822	185,540	11,902	350,057	736,032	11,390,953	3,926,362	164,071	82,331
Percent of total east-bound cargo:												
1940	50.4	3.2	4.2	57.8	1.1	.1	2.0	4.2	65.2	22.5	.9	.6
1939	40.0	2.9	3.0	46.8	1.6	.1	1.5	3.4	53.4	25.5	2.8	.4
1938	42.1	2.6	5.0	49.7	2.3	.1	1.5	4.6	58.2	21.1	2.5	.4

¹ Includes both local and transit cargo.

² General cargo not routed so as to allow segregation between definite countries.

From —	To Europe										To miscellaneous areas				Grand total	Percent of total east-bound cargo		
	France	Germany	Italy	Netherlands	Norway	Spain and Portugal	Sweden	Europe ²	Total	South America	Egypt	Asia	Africa ³					
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons					
West Coast, North America:														Tons				
United States	50,772	15,165	28,968	86,900	30,704	2,259	49,881	10,814	1,099,296	61,329	423	3,000	62,930	6,805,322	39.0	39.9	38.5	
Canada	39,985	14,063	19,248	28,037	25,680	10	129	13,856	2,006,622	9,982	16,409	3,245	35,000	2,275,695	13.0	15.3	11.1	
Bahama Canal Zone ¹									451					3,651				
Central America and Mexico																		
Hawaiian Islands	1,497	2,600	263		8,835		6,939		21,192					92,979	.5	.7	.7	
				89	15		471	2	12,876					517,550	3.2	2.3	2.6	
Total, North America	92,254	31,828	48,479	115,926	65,234	2,269	57,411	24,672	3,170,437	71,311	16,832	6,245	97,930	9,724,597	55.7	58.2	52.9	
West Coast, South America:																		
Chile	42,639	26,035	101,225	23,459	7,523	40,873	27,730	337,071	824,069	1,181	189,211			3,616,620	20.7	20.2	21.4	
Colombia		572	35				14		626	142				122,155	.7	.6	.6	
Ecuador	37,103	398			119		14		82,206	1,663				158,823	.9	1.1	1.0	
Peru	203,554	15,791	1,552	27,466	2,672		21,422	3,938	567,720	7,642				862,600	4.9	6.3	8.6	
South America ²				76			41		253					679		.1		
Total, South America	283,296	42,398	103,210	51,001	10,314	40,873	49,212	341,012	1,474,874	10,631	189,211			4,760,937	27.2	28.3	31.6	
Australasia:																		
Australia	5,985								68,310	1				297,197	1.7	1.2	1.4	
New Zealand									565,886					618,363	3.5	2.3	2.6	
Australasia ²	43,289						14,275	5,821	290,505					238,300	1.4	1.5	1.6	
Total, Australasia	49,274						14,275	5,821	864,701	1				1,153,800	6.6	5.0	5.6	
Asia:																		
Philippine Islands										625				1,015,645	5.8	4.9	6.3	
China		1,556		2,703				17,183	51,655	2,312			2	182,592	1.0	1.6	.9	
Japan	269	4,553		7,306				11,456	66,964	12,011				309,100	1.8	1.6	2.2	
Far East ²				1,095					18,104	5,157				332,745	1.9	.4	.5	
Total, Asia	269	6,109		11,075				28,639	136,723	20,105			2	1,840,082	10.5	8.5	9.9	
Grand total	425,093	80,335	151,689	177,102	75,548	43,112	129,898	400,141	5,646,735	102,048	206,043	6,245	127,392	17,479,416	100.0	100.0	100.0	
Percent of total east-bound cargo:																		
1940	2.4	0.5	0.9	1.0	0.4	0.2	0.7	2.3	32.3	0.8	1.1		0.7	100.0				
1939	4.1	4.0	.5	2.0	.4		1.0	5.0	45.7	.4	.1		.4	100.0				
1938	4.0	3.5	.5	1.9	.3	.1	.9	5.0	40.2	.4	.7	0.1	.4	100.0				

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.³ Other than Egypt.

PRINCIPAL COMMODITIES

Statistics of commodities passing through the Canal are not precise because at the time of transit it is not required that complete manifests of cargo carried by vessels be submitted to the Canal authorities. In lieu of a manifest the master of each vessel is required to submit a cargo declaration, which is a briefly itemized statement, listing the principal items of cargo carried and showing their ports or country of origin and destination. These cargo declarations form the basis of the commodity statistics. There is a natural tendency not to list small miscellaneous shipments but to include them under the head of general cargo. Hence, except in the case of commodities commonly shipped in bulk, such as mineral oils carried in tank ships, wheat, lumber, nitrates, etc., aggregate shipments of the various commodities are likely to be in excess of the tonnage reported during the year and shown in the annual summary. Subject to errors arising from this source, the tonnage of the principal commodities shipped through the Canal during the past 4 years is shown in the following table:

Commodity	Fiscal year ended June 30—			
	1940	1939	1938	1937
ATLANTIC TO PACIFIC				
	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>
Manufactures of iron and steel.....	1,837,593	1,495,497	1,859,087	1,770,293
Minerals oils.....	1,291,886	1,032,671	907,440	794,702
Scrap metal.....	968,045	1,200,368	969,151	1,666,030
Paper and paper products.....	394,021	402,264	422,766	431,672
Sulphur.....	353,452	231,879	297,283	253,294
Coal and coke.....	330,542	117,273	137,404	124,467
Metals, various.....	316,627	400,285	646,679	379,200
Cotton, raw.....	277,978	250,752	142,121	298,300
Tinplate.....	243,784	194,186	237,097	272,772
Phosphates.....	220,647	202,981	328,079	310,015
Machinery.....	205,210	158,835	167,698	155,206
Chemicals (unclassified).....	140,411	127,858	108,861	119,437
Canned goods (food products).....	139,169	132,228	133,111	136,885
Ammonium compounds.....	103,435	51,062	70,924	60,141
Ores, various.....	100,830	45,620	103,902	120,233
Wood pulp.....	96,150	59,834	113,180	105,775
Cement.....	93,286	160,271	153,558	183,978
Automobiles.....	92,781	152,131	207,878	185,983
Textiles.....	87,212	98,325	94,625	99,337
Coffee.....	76,550	73,314	67,641	14,529
Salt.....	71,899	54,751	45,967	45,121
Liquors and wines.....	71,432	74,093	64,981	58,826
Railroad material.....	70,637	82,215	77,588	21,986
Tobacco.....	69,014	64,141	52,489	69,407
Automobile accessories.....	65,512	80,693	91,769	86,289
Lumber and mill products.....	63,492	58,157	42,025	16,700
Asphalt and tar.....	60,370	71,931	151,527	147,193
Nitrate.....	49,345	54,181	68,702	68,078
Soda and sodium compounds.....	48,528	39,694	61,948	59,888
Glass and glassware.....	47,797	60,005	59,734	62,226
Asbestos.....	46,496	35,395	45,659	34,443
Rosin.....	44,606	41,303	35,301	57,793
Creosote.....	43,672	26,399	30,657	34,880
Electrical apparatus.....	43,105	39,207	25,762	16,469
Paints and varnishes.....	37,000	36,057	32,480	38,594
Drugs and medicines.....	31,355	29,114	24,431	16,507
Groceries (unclassified).....	31,279	24,794	22,434	9,826
Floor coverings.....	30,844	27,237	21,967	17,172
Corn.....	30,597	3,049	43,630	40,677
Soap and products.....	29,957	28,630	22,683	17,075
Agricultural implements.....	27,970	43,276	59,838	47,456
Oilseeds.....	25,985	15,676	17,917	18,831
Potash.....	25,950	27,859	40,288	27,290

Commodity	Fiscal year ended June 30—			
	1940	1939	1938	1937
ATLANTIC TO PACIFIC—continued				
	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>
Fertilizers (unclassified).....	25,367	20,633	30,296	23,628
Oilseed cake and meal.....	24,427	27,504	9,739	1,750
Clays.....	22,588	21,461	20,913	24,929
Rubber, manufactured.....	21,784	16,642	15,694	12,798
Sand.....	21,776	25,788	56,973	52,160
Extract, quebracho.....	20,910	20,652	12,357	9,129
Slate.....	20,746	20,616	10,875	10,610
Rubber, scrap.....	20,328	11,837	2,583	2,835
Flour.....	20,232	23,445	9,271	12,991
Oils, vegetable.....	19,366	32,002	29,341	26,116
Sugar.....	19,188	36,832	56,941	74,185
Slag.....	9,230	26,769	62,546	50,299
All others.....	1,133,577	1,058,275	1,031,836	1,047,926
Total.....	9,819,600	9,011,267	9,688,560	9,895,632
PACIFIC TO ATLANTIC				
Lumber.....	3,669,482	3,191,093	2,850,953	2,748,917
Ores.....	2,165,646	1,991,690	2,126,657	1,851,254
Mineral oils.....	2,014,237	2,777,201	2,874,809	3,571,626
Sugar.....	1,455,683	1,329,276	1,486,516	1,358,948
Nitrate.....	1,361,422	1,444,148	1,401,003	1,328,482
Canned goods (food products).....	1,248,059	1,232,636	991,436	1,092,356
Metals, various.....	706,001	674,314	698,170	653,250
Wheat.....	611,961	1,539,474	705,600	1,218,581
Cold storage (food products) ¹	444,291	335,874	334,659	304,332
Fruit, dried.....	275,637	337,769	291,444	233,957
Wood pulp.....	275,350	235,768	313,969	140,612
Oils, vegetable.....	211,457	174,944	170,686	197,000
Rubber, raw.....	185,819	24,934	62,505	70,536
Flour.....	176,126	153,642	233,810	259,389
Coffee.....	166,881	185,341	174,778	177,209
Wool.....	158,148	138,622	123,297	159,586
Fruit, fresh.....	135,143	419,109	347,527	216,770
Beans, edible, dry.....	130,021	165,185	175,917	134,239
Paper and paper products.....	127,415	120,723	137,578	122,894
Barley.....	117,625	259,612	237,137	166,578
Copra.....	111,438	156,657	163,521	155,413
Cotton, raw.....	98,920	106,211	127,473	114,087
Rice.....	93,579	31,127	57,109	44,906
Phosphates.....	92,259	87,715	44,933	39,280
Asphalt and tar.....	87,538	61,861	107,187	65,058
Potash.....	75,777	48,287	33,731	32,041
Borax.....	61,241	74,239	89,831	96,619
Molasses and sirups.....	61,577	101,750	47,377	127,381
Oilseed cake and meal.....	60,669	62,925	63,798	76,253
Skins and hides.....	53,961	58,700	56,346	72,761
Oats.....	49,990	102,650	71,576	100,629
Soya beans.....	43,200	236,099	52,934	107,612
Textiles.....	43,084	30,986	51,009	75,652
Hemp, unmanufactured.....	40,118	24,293	18,490	26,176
Bananas.....	36,624	45,557	53,319	38,501
Tallow.....	36,573	30,864	26,831	32,050
Coconuts and products.....	29,543	27,064	22,747	14,933
Porcelainware.....	26,409	25,324	45,934	51,608
Chemicals (unclassified).....	25,286	18,542	33,704	30,153
Fish meal.....	24,669	32,473	35,866	37,901
Wines.....	24,387	29,879	28,718	28,571
Fish oil.....	19,414	34,433	18,707	20,218
Guano.....	4,700	27,830	—	32,230
All others.....	639,056	668,479	707,872	786,194
Total.....	17,479,416	18,855,360	17,697,364	18,212,743

¹ Does not include fresh fruit.

CLASSIFICATION OF VESSELS BETWEEN LADEN AND BALLAST TRAFFIC

The following table summarizes the ocean-going commercial traffic through the Canal during the fiscal year 1940 segregated between laden ships and those in ballast, as well as between tankers, ore ships, passenger ships, general cargo ships, and those not designed to carry cargo, and also between vessels of United States registry and those of all other nationalities:

Classification	Vessels of United States registry			Vessels of foreign registry			Total traffic		
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total
CARGO AND CARGO-PASSENGER SHIPS									
Tank ships, laden:									
Number of transits	21	100	121	70	90	160	91	160	250
Panama Canal net tonnage	107,830	577,414	685,244	318,626	571,156	889,782	456,156	1,148,570	1,604,726
Tolls	\$97,017	\$519,673	\$616,690	\$313,744	\$514,496	\$828,240	\$110,811	\$1,033,713	\$1,144,524
Cargo (tons)	188,842	1,067,678	1,256,520	636,480	1,091,063	1,727,543	845,322	2,161,741	3,010,063
Tank ships, ballast:									
Number of transits	82	6	88	86	31	117	168	37	205
Panama Canal net tonnage	485,084	31,410	516,494	502,429	132,488	634,917	987,313	163,808	1,151,411
Tolls	\$349,261	\$22,615	\$371,876	\$361,749	\$65,391	\$427,140	\$711,010	\$118,006	\$829,016
Ore ships, laden:									
Number of transits		59	59		20	20		79	70
Panama Canal net tonnage		267,579	267,579		87,680	87,680		335,259	335,259
Tolls		\$240,821	\$240,821		\$78,912	\$78,912		\$319,733	\$319,733
Cargo (tons)		1,125,850	1,125,850		440,500	440,500		1,566,330	1,566,330
Ore ships, ballast:									
Number of transits	61		61	19		19	80		80
Panama Canal net tonnage	276,070		276,070	83,296		83,296	359,366		359,366
Tolls	\$198,770		\$198,770	\$59,973		\$59,973	\$258,743		\$258,743
Passenger ships, laden:									
Number of transits	81	72	153	174	167	341	255	289	494
Panama Canal net tonnage	488,395	412,412	900,808	970,160	931,194	1,901,354	1,467,556	1,313,606	2,811,162
Tolls	\$439,556	\$371,171	\$810,727	\$881,214	\$838,075	\$1,719,319	\$1,320,800	\$1,209,246	\$2,530,046
Cargo (tons)	294,547	378,723	673,270	433,581	819,220	1,252,801	728,128	1,197,943	1,926,071
Passenger ships, ballast:									
Number of transits				11	3	14	11	3	14
Panama Canal net tonnage				69,486	8,565	78,051	69,486	8,565	78,051
Tolls				\$50,030	\$6,167	\$56,197	\$50,030	\$6,167	\$56,197
General cargo ships, laden:									
Number of transits	710	751	1,461	1,016	1,240	2,256	1,726	1,991	3,717
Panama Canal net tonnage	3,353,379	6,831,296	10,184,675	3,946,688	5,031,230	8,977,918	7,300,067	8,509,077	15,809,144
Tolls	\$3,018,041	\$6,130,062	\$9,148,103	\$3,552,019	\$4,528,107	\$8,080,126	\$6,370,060	\$7,638,169	\$14,228,229
Cargo (tons)	3,319,335	5,569,642	8,888,977	4,423,815	7,043,740	11,467,555	8,243,150	12,553,382	20,796,532
General cargo ships, ballast:									
Number of transits	47	3	50	371	39	410	418	42	460
Panama Canal net tonnage	205,507	4,170	209,677	1,706,460	55,269	1,761,669	1,911,967	59,379	1,971,346
Tolls	\$147,965	\$3,003	\$150,968	\$1,228,651	\$39,750	\$1,268,401	\$1,376,616	\$12,752	\$1,419,369

LADEN AND BALLAST TRAFFIC BY NATIONALITY

In the table below the ships of each nationality have been segregated to show separate statistics on vessels which were carrying cargo and/or passengers at the time of transiting the Canal and those which passed through in ballast:

Nationality	Number of transits		Panama Canal net tonnage		Tolls	
	Laden	Ballast	Laden	Ballast	Laden	Ballast
British.....	823	233	4,552,031	1,230,969	\$1,096,828	\$879,119
Chilean.....	36	2	108,341	3,831	151,307	2,758
Colombian.....	14	5	6,328	2,260	5,695	1,627
Danish.....	160	14	586,263	11,901	527,636	30,168
Egyptian.....	4	3	16,059	12,142	14,453	8,742
Finnish.....	2	1	7,254	2,097	6,529	1,510
French.....	88	5	350,528	27,838	315,475	20,043
German.....	54	1	217,505	3,397	195,755	286
Greek.....	130	45	581,622	203,992	523,460	146,874
Honduran.....	61	20	95,679	31,577	86,111	22,735
Hungarian.....	1	—	3,932	—	3,539	—
Italian.....	44	2	311,450	7,940	280,305	5,717
Japanese.....	266	6	1,559,820	40,475	1,403,838	29,142
Latvian.....	7	—	22,237	—	20,013	—
Mexican.....	2	—	1,483	—	1,335	—
Netherlands.....	316	23	556,729	69,909	501,056	50,334
Nicaraguan.....	6	1	2,214	369	1,993	266
Norwegian.....	131	126	1,916,064	591,200	1,751,458	425,664
Panamanian.....	206	37	327,901	136,064	295,111	97,966
Peruvian.....	5	1	9,690	654	8,721	471
Philippine.....	14	—	67,760	—	60,984	—
Rumanian.....	3	1	10,657	3,876	9,591	2,791
Soviet.....	6	—	13,807	—	12,426	—
Spanish.....	3	3	11,855	11,855	10,670	8,536
Swedish.....	84	26	383,658	119,981	345,292	86,386
United States.....	1,795	202	8,685,204	1,003,539	7,816,683	722,548
Uruguayan.....	—	1	—	1,231	—	886
Yugoslavian.....	20	7	84,867	29,301	76,380	21,097
Total, 1940.....	4,581	765	20,580,938	3,563,428	18,522,844	2,565,668
Total, 1939.....	4,875	1,005	22,507,503	4,662,504	20,256,753	3,357,003

AVERAGE TONNAGE, TOLLS, AND TONS OF CARGO PER CARGO-CARRYING VESSEL

The average measurement tonnage, tolls, and tons of cargo per cargo-carrying vessel of 300 net tons and over (Panama Canal measurement), transiting the Panama Canal during the past 3 years are shown in the following tabulation:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Measured tonnage:			
Panama Canal net.....	4,518	4,633	4,700
Registered gross.....	5,817	5,896	5,979
Registered net.....	3,489	3,537	3,564
Tolls.....	\$3,946.55	\$4,027.30	\$4,203.75
Tons of cargo (including vessels in ballast).....	5,109	4,754	4,977
Tons of cargo (laden vessels only).....	5,966	5,719	5,784

¹ Estimated tonnage based on revised measurement rules which became effective Mar. 1, 1938.

STEAM, MOTOR, AND OTHER VESSELS

The following table shows ocean-going commercial vessels transiting the Canal during each of the past 4 fiscal years, segregated according to the method of propulsion:

	1940	1939	1938	1937
Steamers:				
Oil burning.....	2,567	2,444	2,396	2,236
Coal burning.....	637	1,019	900	997
Motorships.....	2,135	2,398	2,204	2,115
Miscellaneous.....	31	42	24	39
Total.....	5,370	5,903	5,524	5,387

FREQUENCY OF TRANSITS OF VESSELS THROUGH THE PANAMA CANAL

During the fiscal year 1940, 1,613 individual ocean-going commercial vessels, representing 29 nationalities, passed through the Panama Canal. In the aggregate these vessels made a total of 5,370 transits. The number of transits made by individual ships varied from 1 to 103 and averaged 3.33. The greatest number, amounting to 103, was made by the small Panamanian steamer *Colombia*, plying between Cristobal and the west coast of Colombia.

Although vessels of United States registry led in the number of transits during the year, Great Britain, which ranked second, was first in the number of individual vessels, with 454. There were 415 individual vessels of United States registry which passed through during the year.

The following table shows the number of individual ships, the frequency of transits per vessel, the total transits for the year, and the average number of transits per individual vessel, segregated by nationality:

Vessels making indicated number of transits during fiscal year 1940

Nationality	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	24	25	26	32	34	37	39	42	103	Total ships	Total transits	Average number of transits
Argentina	1																				1								1	1	1.00	
British	174	146	48	35	31	12	4	1		1											1								454	1,073	2.36	
Chilean	3										1	1									6								1	38	6.33	
Colombian																					1								19	19	19.00	
Danish	12	16	8	8	4	2		3	2												55								7	174	3.16	
Egyptian	1	1																			3								3	7	2.33	
Finnish	1	1																			2								3	3	1.50	
French	1	1																			1								23	93	4.04	
German	25	6	3	7	3																35								55	157	1.57	
Greek	38	31	13	5	2	1															90								175	175	1.94	
Honduran	1	1																			1	1							9	81	9.00	
Hungarian	1																				1								1	1	1.00	
Italian	4	3																			14								46	46	3.29	
Japanese	16	26	11	20	11	6		1													90								272	272	3.02	
Latvian																					2								7	7	3.50	
Mexican	2	1																			3								4	4	1.33	
Netherlands	18	20	3	3	2	1		1	2	1	1					2					59								340	340	5.76	
Nicaragua																					1								7	7	7.00	
Norwegian	92	60	32	18	9	12	3				1	1									229								557	557	2.43	
Panamanian	17	8	4	3		2	1	2													40								243	243	6.08	
Peruvian																					2								6	6	3.00	
Philippine																					4								14	14	3.50	
Rumanian																					3								4	4	1.33	
Soviet	7	1																			8								9	9	1.13	
Spanish																					3								6	6	2.00	
Swedish	24	10	2	4	1											1	1				43								110	110	2.56	
United States	66	70	42	51	32	39	32	41	17	4	2	3	3	1	3	3	4	1	1	1	415								1,997	1,997	4.81	
Uruguayan	1																				1								1	1	1.00	
Yugoslavian	7																				16								27	27	1.69	
Total, 1940	511	427	168	164	103	75	42	49	22	6	7	5	3	3	1	6	3	4	4	2	3	1	1	1	1	1	1	1	1	1,613	5,370	3.33
Total, 1939	484	415	131	135	90	111	83	69	23	20	5	2	2	3	2	4	4	6	3	2	1	1	4	3	1	1	1	1	1	1,609	5,903	3.67
Total, 1938	493	399	162	133	77	122	74	45	30	13	6	4	2	3	3	1	3	4	3	2	1	3	1	1	1	1	1	1	1	1,558	5,524	3.55

1 Includes also 6 vessels, each making following number of transits: 21, 28, 55, 60, 74, and 86.

2 Includes also 6 vessels, each making following number of transits: 23, 31, 47, 58, 61, and 93.

The following tabulation shows for the fiscal year 1940 the number of vessels making a given number of transits through the Panama Canal (from 1 to 103), the percent which each class formed of the total number of vessels (1,613), their aggregate number of transits, and their percent of the total ocean-going commercial transits (5,370):

Number of transits	Number of vessels	Per- cent of indi- vidual vessels (1,613)	Total num- ber of transits	Percent of total Canal transits (5,370)	Number of transits	Number of vessels	Per- cent of indi- vidual vessels (1,613)	Total num- ber of transits	Percent of total Canal transits (5,370)
1.....	511	31.6	511	9.5	17.....	3	0.2	51	0.9
2.....	427	26.4	854	15.9	18.....	4	.2	72	1.3
3.....	168	10.4	504	9.4	19.....	4	.2	76	1.4
4.....	164	10.1	656	12.2	20.....	2	.1	40	.7
5.....	103	6.4	515	9.6	24.....	3	.2	72	1.3
6.....	75	4.6	450	8.4	25.....	1	.1	25	.5
7.....	42	2.6	294	5.5	26.....	1	.1	26	.5
8.....	49	3.0	392	7.3	32.....	1	.1	32	.6
9.....	22	1.4	198	3.7	34.....	1	.1	34	.6
10.....	6	.4	60	1.1	37.....	1	.1	37	.7
11.....	7	.4	77	1.4	39.....	1	.1	39	.8
12.....	5	.3	60	1.1	42.....	1	.1	42	.8
13.....	3	.2	39	.8	103.....	1	.1	103	1.9
15.....	1	.1	15	.3					
16.....	6	.4	96	1.8	Total.....	1,613	100.0	5,370	100.0

GROSS TONNAGE OF VESSELS

The 5,370 ocean-going commercial vessels which transited the Canal in the fiscal year 1940 included 5,346 merchant vessels, yachts, etc., paying on the basis of net tonnage, and 24 vessels paying tolls on the basis of displacement tonnage. Of the 5,346 merchant vessels, yachts, etc., 2,050, or 38.3 percent, were vessels of from 4,000 to 6,000 registered gross tons. Vessels between 6,000 and 8,000 tons made up 23.1 percent of the total and those from 8,000 to 10,000 tons, 12.8 percent. Vessels under 2,000 tons accounted for 12.2 percent of the total, while those of 10,000 tons and over represented 6.1 percent. The average registered gross tonnage of all transits was 5,815 as compared with 5,881 for the previous year, a decrease of 1.1 percent.

The following tabulation shows the ocean-going commercial vessels, excluding those based on displacement tonnage, in groups according to registered gross tonnage, segregated by nationality, with average tonnages for 1940 and 1939 and group percentages for the past year:

Segregation of transits by registered gross tonnage of vessels, fiscal year 1940

Nationality	Under 2,000	2,000 to 3,999, inclusive	4,000 to 5,999, inclusive	6,000 to 7,999, inclusive	8,000 to 9,999, inclusive	10,000 to 11,999, inclusive	12,000 to 13,999, inclusive	14,000 to 15,999, inclusive	16,000 to 17,999, inclusive	20,000 and over ¹	Total ²	Registered gross tonnage	Average registered gross tonnage per vessel, fiscal year—	
													1940	1939
Belgian.....	61	17	495	198	123	87	26	25	21	3	1,056	7,183,615	6,893	8,718
British.....	19	5		32							38	253,392	6,372	6,372
Colombian.....	70	21	51	14	7	11					171	11,333	6,605	6,605
Danish.....												696,397	4,007	4,328
Egyptian.....		2									3	33,491	4,784	
Finnish.....	24		15	31	18	5					3	11,310	3,780	6,699
French.....	20	11	138	26	4	1			2		55	504,354	5,423	5,069
German.....	12	69									175	271,213	5,252	5,302
Greek.....											81	919,087	2,694	2,716
Honduran.....											1	218,226	4,323	
Hungarian.....											1	4,323	4,323	
Italian.....			3	18	6	12				7	46	569,098	11,067	8,128
Japanese.....			4	136	113	15	4				272	2,162,006	7,919	7,745
Latvian.....		3	4								7	20,012	4,135	3,294
Mexican.....	2										2	2,518	1,259	
Netherlands.....	221	58	11	16	20	10					339	737,918	2,177	3,024
Nicaraguan.....	7										7	4,361	623	
Norwegian.....	42	66	298	80	68	3					7	2,932,868	5,265	5,356
Panamaian.....	154	40	8	21	14	6					213	660,181	2,717	2,550
Peruvian.....	2	4									6	15,598	2,994	
Philippine.....			14								14	71,561	5,112	5,212
Rumanian.....		1	3								1	16,369	4,062	
Soviet.....		5	1								6	18,058	3,010	4,387
Spanish.....											6	30,378	5,063	
Swedish.....	3	16	37	2	3	5				2	110	1,011,211	9,193	7,963
United States.....	9	81	916	641	306	44		37			1,997	12,639,715	6,329	6,432
Uruguayan.....											1	1,782	1,782	
Venezuelan.....	1												2,815	
Yugoslavian.....		3	23	1							27	130,084	5,040	5,388
Total.....	650	402	2,050	1,236	682	109	30	62	23	12	5,346	31,085,719	5,815	5,881
Percent of total.....	12.2	7.5	38.3	23.1	12.8	3.7	.6	1.2	.4	.2	100.0			

¹ This group includes the following: British, Mauretania, 35,739 tons; Duchess of Richmond (2 transits), 29,022 tons; Italian, Augustus (4 transits), 30,418 tons, Conte Grande (2 transits), 23,861 tons, Conte Blarmino, 23,255 tons; and Swedish, Kungsholm (2 transits), 21,256 tons.

² 24 vessels paying tolls on displacement—1 Argentine, 17 British, 2 Mexican, 1 Netherlands and 3 Soviet—are not included.

SUMMARY OF PASSENGER MOVEMENT AT CANAL DURING 1940

The following tabulation shows by months the number of passengers, exclusive of transients, disembarking at Canal Zone ports during the fiscal year 1940, segregated as between first-class and all others, with comparative totals for the fiscal years 1939 and 1938:

	Passengers disembarking			Passengers embarking		
	First-class	Others	Total	First-class	Others	Total
July.....	2,024	1,130	3,154	1,842	1,445	3,287
August.....	2,091	1,971	4,062	1,902	1,482	3,384
September.....	2,341	2,143	4,484	1,700	870	2,630
October.....	1,922	3,661	5,583	1,211	1,522	2,733
November.....	1,797	1,676	3,473	1,059	640	1,699
December.....	1,842	1,686	3,528	1,293	997	2,290
January.....	1,829	1,053	2,882	935	695	1,630
February.....	1,745	2,123	3,868	1,314	1,352	2,666
March.....	1,552	2,132	3,684	1,640	1,351	2,991
April.....	1,444	2,294	3,738	1,383	1,326	2,709
May.....	1,488	2,866	4,354	1,594	1,228	2,822
June.....	1,878	1,549	3,427	1,806	1,434	3,240
Total, 1940.....	21,953	24,284	46,237	17,739	14,342	32,081
Total, 1939.....	19,073	16,368	35,441	18,833	16,609	35,442
Total, 1938.....	19,302	21,784	41,086	19,588	19,300	38,888

As compared with 1939, the fiscal year 1940 showed an increase of 30.5 percent in the number of arrivals, and in comparison with 1938 an increase of 12.5 percent; in the number of departures there was a decrease of 9.5 percent in comparison with 1939 and 17.5 percent under 1938.

The following table shows the passenger traffic through the ports of Cristobal and Balboa during the past 3 years:

	Port of Cristobal			Port of Balboa		
	1940	1939	1938	1940	1939	1938
Passengers disembarking.....	31,435	26,799	28,620	14,802	8,642	12,466
Passengers embarking.....	23,012	26,448	26,474	9,069	8,994	12,414

A further segregation of the passenger movement shows that 38,909 incoming and 24,105 outgoing passengers came from or were destined to ports of the Atlantic, and 7,328 incoming and 7,976 outgoing passengers were brought from or were destined to ports of the Pacific.

TRANSIENT PASSENGERS

In addition to the figures shown above of passengers disembarking and embarking, there were 90,666 transient passengers brought to the Isthmus by vessels calling at Canal ports during the fiscal year 1940. For the fiscal year 1939 there were 114,053, and in the fiscal year 1938 there were 131,837. The number in 1940 decreased 23,387, or 20.5 percent, in comparison with those in 1939, and registered a decline

of 41,171, or 31.2 percent, under 1938. Most of these passengers came ashore for short periods but since they departed on the same vessels on which they arrived they are not included in the tabulation of passengers ending or beginning voyages at the Isthmus. The origin and destination of these transient passengers are indicated in the following tabulation:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Remainling on board vessels transiting Canal:			
Atlantic to Pacific	53,351	48,058	54,872
Pacific to Atlantic	23,334	30,750	41,947
Remainling on board vessels entering port but not transiting Canal:			
Atlantic to Atlantic	12,672	33,996	33,914
Pacific to Pacific	1,309	1,219	1,104
Total	90,666	114,023	131,837

During prior years there have been a great number of transient passengers visiting the Canal as members of special tourist cruises. There was a very sharp decline in this activity during the past fiscal year as evidenced by the statistics of passengers on board vessels from the Atlantic Ocean not transiting the Canal. Whereas during fiscal year 1939 a total of 59 cruises were conducted through Gaillard Cut, only one such cruise was conducted during the past fiscal year.

CANAL OPERATION AND MAINTENANCE

HOURS OF OPERATION

Dispatching of ships through the Canal is conducted on schedules. Vessels awaiting transit begin moving through the Canal from the terminal ports at 6 a. m. and dispatches are made thereafter from each terminus at intervals of about half an hour. The following is a summary of the arrangements in effect at the end of the fiscal year:

From Cristobal Harbor, first ship at 6 a. m., last at about 3:30 p. m.; from Balboa anchorage, first ship at 6 a. m., last at 2:30 p. m. This applies to vessels averaging 10 to 12 knots. In case a vessel is capable of 15 knots, departure may be made up to about 3 p. m. from Balboa and 4 p. m. from Cristobal.

Tankers with inflammable cargoes are dispatched at the discretion of the Captain of the Port and are not permitted to proceed unless they can clear Gaillard Cut before dark. Heavy tankers carrying gasoline cargo are usually restricted to the early morning schedules, leaving at 6, 6:30, and 7 a. m., to assure their not meeting other vessels in Gaillard Cut.

During the past year special precautions and regulations were put into effect for handling ships in the locks.

OPERATING SCHEDULES OF LOCKS

At the end of the fiscal year, the schedules of operating shifts of the locks were as follows:

Gatun:

- 7 a. m. to 3 p. m.—8 locomotives.
- 7:45 a. m. to 3:45 p. m.—6 locomotives.
- 3 p. m. to 11 p. m.—8 locomotives.
- 3:45 p. m. to 11:45 p. m.—6 locomotives.

Pedro Miguel:

- 8 a. m. to 4 p. m.—8 locomotives.
- 4 p. m. to 12 p. m.—8 locomotives.

Miraflores:

- 7 a. m. to 3 p. m.—8 locomotives.
- 9 a. m. to 5 p. m.—8 locomotives.
- 5 p. m. to 1 a. m.—8 locomotives.

LOCKAGES AND LOCK MAINTENANCE

Lockages and vessels handled are shown in the following table by months for the past fiscal year, with corresponding totals for the past 5 years:

Month	Gatun		Pedro Miguel		Miraflores		Total	
	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels
1939								
July.....	497	656	515	654	509	640	1,521	1,950
August.....	480	636	503	663	495	661	1,478	1,960
September.....	457	621	475	637	460	613	1,392	1,871
October.....	455	634	458	639	441	622	1,354	1,895
November.....	465	624	484	641	466	653	1,415	1,918
December.....	468	693	474	682	459	670	1,401	2,045
1940								
January.....	442	646	449	672	438	655	1,329	1,973
February.....	402	612	402	593	398	577	1,202	1,782
March.....	431	684	431	673	429	670	1,291	2,027
April.....	379	617	389	598	383	604	1,151	1,819
May.....	435	648	422	629	421	640	1,278	1,917
June.....	391	642	390	562	387	565	1,168	1,769
Total.....	5,302	7,713	5,392	7,643	5,286	7,570	15,980	22,926
Fiscal year:								
1939.....	6,054	7,929	6,283	8,064	6,221	7,988	18,558	23,981
1938.....	5,651	7,385	5,870	7,420	5,813	7,316	17,334	22,121
1937.....	5,504	7,156	5,735	7,474	5,608	7,218	16,847	21,848
1936.....	5,334	6,755	5,548	6,930	5,538	6,866	16,420	20,551
1935.....	5,316	6,893	5,490	6,859	5,481	6,837	16,287	20,589

There was a delay at Gatun on May 22, 1940, of 6 hours and 9 minutes to six northbound ships, due to a broken strut on miter gate No. 15. Other than this, there were only a few incidents due to faulty operation or failure of equipment which held up traffic through

the locks. The following summary includes all delays to vessels while transiting the locks, due to the incidents mentioned:

Locks	Number of vessels delayed	Aggregate delay caused all vessels
Gatun.....	30	42 hours 2 minutes.
Pedro Miguel.....	21	5 hours 53 minutes.
Miraflores.....	17	3 hours 20 minutes.
Total	68	51 hours 15 minutes.

The average number of lockages made daily, and the average number of vessels handled per lockage, during each of the past 5 fiscal years, are shown in the table following:

Fiscal year	Average number of lockages per day			Average number of vessels per lockage		
	Gatun	Pedro Miguel	Miraflores	Gatun	Pedro Miguel	Miraflores
1936.....	14.6	15.2	15.1	1.27	1.25	1.25
1937.....	15.1	15.7	15.4	1.30	1.30	1.24
1938.....	15.5	16.1	15.9	1.31	1.26	1.29
1939.....	16.6	17.2	17.0	1.31	1.28	1.28
1940.....	14.5	14.8	14.5	1.45	1.41	1.42

Special construction work at all locks by the Municipal, Mechanical, and Electrical Divisions was in full progress by the end of the year. While most of the work is being done by those divisions, it has required much work by the regular lock forces in altering, relocating, and protecting operating machinery and equipment, and also in extending services to and rendering all assistance possible to these divisions, so that they could perform their work with a minimum of interference with the permanent installations.

POWER FOR CANAL OPERATION

The power system was operated throughout the year with a combined output of 98,425,998 kilowatt-hours as compared with a combined generator output of 86,185,409 kilowatt-hours for the preceding fiscal year. During the year 90,814,522 kilowatt-hours were distributed to consumers as compared to 79,532,349 kilowatt-hours for the preceding year. From the above there resulted a transmission, transformation, and distribution loss of 7,611,476 kilowatt-hours, or 7.73 percent, as compared to 6,653,060 kilowatt-hours, or 7.72 percent, for the preceding year. The maximum peak load carried on the system during the past fiscal year was 22,200 kilowatts, occurring on April 17, 1940.

The Madden hydroelectric generating station operated throughout the year, generating approximately 62.8 percent of the total power

output. The Gatun hydroelectric station generated approximately 37.2 percent of the total power output, while the Miraflores Diesel-electric generating station generated less than 0.1 percent of the output for the past fiscal year. The amounts of water consumed for the generation of power were 400 cubic feet per kilowatt-hour at Madden station, and 850 cubic feet per kilowatt-hour at Gatun station. The Miraflores Diesel-electric generating station was maintained throughout the year on a full time, stand-by basis. The Diesel engines were operated on only two occasions during the year for load purposes.

There were three temporary failures of transmission line service, in whole or in part. One was caused by the failure of the cables carrying load to a transformer at the Gatun power station; one due to relay action of both line switches at Madden power station, the cause of which was unknown; and one due to a small animal getting into the equipment at Gatun substation.

The routine operation, inspection, and testing of power system equipment was carried on throughout the year. Generating Unit No. 3 was completely overhauled, including the hydraulic turbine and electrical generator. This work consisted of the removal of the rotor and miscellaneous parts, the cleaning and painting of the stator and rotor coils, and repairs to worn mechanical parts.

Two air blowers were installed at the Madden hydroelectric generating station to provide additional ventilation to the substructure part of the station. A new 125-volt battery was also installed, replacing a similar battery which was in an unsatisfactory condition. Both generator units of the Miraflores Diesel-electric generating station were completely overhauled, which work included cleaning and painting of the windings. Defective stator windings of the 1,500 kilovolt-ampere synchronous condenser were replaced, and this unit relocated to a site between the Diesel station and the substation buildings, for the purpose of securing a more efficient operation of the unit. A 5,000 kilovolt-ampere transformer, with necessary switching gear and other auxiliary equipment, was installed at Miraflores substation. The purpose of the new transformer is to provide 11,000-volt service for new Army, Navy, and Canal activities on the west side of the Canal. Switchgear, instruments, control wiring, etc., for new 2,300-volt feeder at Miraflores substation was installed and the substation building reroofed during the year. At the Gatun substation, supervisory control apparatus for control of a new oil circuit breaker for 6,600-volt feeder was installed. The capacity of the Summit substation was increased by the installation of a new 2,000 kilovolt-ampere transformer, with auxiliary equipment. The purpose of this addition is to provide duplicate sources of power to the Summit radio station.

The program of removing brackets and having them overhauled in the mechanical division shops, for reinstallation on towers, was continued throughout the year. Reconditioned cantilever brackets have been installed on all strain towers between Summit and Gatun. The usual maintenance and patrolling of the transmission lines was continued during the year. This included the systematic testing and replacing of high-voltage insulators that were developing defects and replacing worn or defective insulator hardware, thus diminishing the probability of power service interruptions.

On January 1, 1938, the Light and Power System was enabled to make a rate reduction to the consumers of electric power in excess of 100,000 kilowatt-hours per month. In spite of this reduction the Light and Power System continued to make slightly more than the required return of 3 percent on invested capital, and with the increased power revenue from employees and resulting from the local activity, the System was again able to make another rate reduction. This rate reduction, effective March 1, 1940, of 0.25 cents per kilowatt-hour for consumption between 151 and 50,000 kilowatt-hours per month was applicable to all users and created a saving to power users estimated at \$10,000 per month.

WATER SUPPLY

The inflow of water during the past 2 years from all portions of the Gatun Lake drainage basin as well as the utilization and losses of the water are summarized in the table below. Each year covers the 12 months ended June 30, and thus embraces the cycle of a dry and rainy season.

	Billion cubic feet, fiscal year		Percent of total yield, fiscal year	
	1940	1939	1940	1939
Yield from Madden Lake drainage basin.....	66.09	92.65	36.3	37.3
Yield from land area downstream from Madden Dam.....	75.89	115.94	41.7	46.6
Direct rainfall on Gatun Lake surface.....	40.09	40.12	22.0	16.1
Total yield.....	182.07	248.71	100.0	100.0
Evaporation from lake surfaces.....	22.61	22.19	12.4	8.9
Gatun Lake lockages.....	39.27	45.58	21.6	18.3
Gatun hydroelectric power.....	31.56	28.93	17.3	11.6
Gatun spillway waste.....	84.40	159.12	46.4	64.0
Storage, increase or decrease (—).....	2.45	—8.99	1.3	—3.6
Leakage and municipal.....	1.78	1.88	1.0	.8
Total uses and losses.....	182.07	248.71	100.0	100.0

The 1940 total yield of 182.07 billion cubic feet represents an average inflow of 5,758 cubic feet per second, which is 14 percent below the 26-year annual average of 6,702 cubic feet per second. Operation of the Gatun spillway during the fiscal year 1940 totaled 2,085 gate-hours and of the Miraflores spillway, 306 gate-hours.

DRY SEASON—1940

From a Panama Canal water supply standpoint, the 1940 dry season began January 7 and ended May 28, a duration of 143 days. During the dry-season period the run-off from the Gatun Lake drainage basin is not sufficient to supply the Panama Canal requirements for lockages and generation of power, and draft on reserve storage in Madden and Gatun Lakes becomes necessary to make up the deficiency. The 1940 dry-season period was somewhat longer than usual, but the rainfall and run-off remained comparatively high much of the time, and the season as a whole presented no unusual features. The total yield of the Gatun Lake drainage basin during the 4½ months of the 1940 dry season amounted to 22.32 billion cubic feet. Of the amount, 11.24 billion cubic feet were lost by evaporation from Gatun and Madden Lake surfaces, leaving a net yield of 11.08 billion cubic feet available for useful purposes. As dry season water requirements amounted to 25.76 billion cubic feet, it was necessary to draw 14.68 billion cubic feet from reserve storage in Madden and Gatun Lakes. This necessary draft on storage is equivalent to 3.21 feet depth on Gatun Lake. The elevation of Gatun Lake was regulated by spilling at Gatun and inflow from Madden Lake. During the 1940 dry season the elevation of Gatun Lake varied from a maximum of 86.58 feet on January 7 to a minimum of 83.76 feet on May 28.

FLOODS

No floods of any great magnitude occurred during the calendar year 1939. November was the month of greatest run-off, and the heaviest general rains of the year occurred on November 6-7, producing a maximum 24-hour run-off from the Gatun Lake drainage basin of 90,800 cubic feet per second.

MADDEN LAKE

Madden Lake began the fiscal year 1940 at elevation 215.37 feet. The lake was allowed to rise until September 3, when sill elevation of the Madden Dam spillway, 232 feet, was attained, at which time free flow conditions over the dam were established. Free flow conditions continued until November 30, when the drum gates were raised to elevation 250 feet. Madden Lake attained elevation 240 feet on December 10, and thereafter through December and January the elevation was maintained near this level by needle-valve spilling. The maximum elevation for the year was 240.94 feet on January 29. On April 12, with the lake elevation near 238 feet, the drum gates were lowered to sill elevation of 232 feet. Drum-gate and needle-valve spilling lowered the lake to near elevation 231 feet. Thereafter Madden Lake fell slowly to its dry season minimum of 228.35 feet

on May 28. With the beginning of the rainy season Madden Lake rose again, reaching elevation 230.99 feet on June 30, 1940.

MADDEN DAM

The maximum spilling at Madden Dam during the year was 17,600 cubic feet per second on April 12. Observations on possible seepage through the ridges adjacent to the dam and observations on uplift pressure and gallery drain seepage in the dam were continued throughout the year.

MAINTENANCE OF CHANNEL

Dredges were at work throughout the year dredging and maintaining the Canal channel and terminal harbors from deep water of the Atlantic entrance to deep water in the Pacific. In addition, work on the various authorized special maintenance projects was continued. Excavation during the year is summarized in the following tables:

Location	Maintenance		
	Earth	Rock	Total
<i>Canal prism dredging</i>			
Atlantic entrance:	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Maintenance.....	2,117,190	33,700	2,150,890
Project No. 8.....	28,600	5,400	34,000
Gatun Lake: Ordinary channel maintenance.....	982,200	46,200	¹ 1,028,400
Gaillard Cut:			
Maintenance, including slides.....	352,700	581,200	933,900
Project No. 13.....	57,800	485,600	543,400
Miraflores Lake: Maintenance.....	52,300	5,700	58,000
Pacific entrance:			
Maintenance.....	13,300	23,800	37,100
Project No. 1-B.....	66,500	113,300	179,800
Total Canal prism.....	3,670,500	1,294,900	4,965,400
<i>Auxiliary dredging</i>			
Cristobal Outer Harbor: Ordinary maintenance.....	6,400	30,200	36,600
Cristobal Inner Harbor: Ordinary maintenance.....	3,000	-----	3,000
Fort Sherman-Cristobal: Ferry slips.....	6,000	500	6,500
Coco Solo submarine base.....	9,200	119,500	128,700
Gatun Lake (auxiliary).....	4,650	1,800	6,450
Miraflores Lake (auxiliary).....	59,700	3,100	62,800
Salvage operations: S. S. <i>Copaipo</i>	300	-----	300
Chagres River gravel service:			
Run-of-bank gravel.....	293,800	-----	293,800
Stripping gravel beds.....	225,000	-----	225,000
Total auxiliary dredging.....	608,050	155,100	763,150
Grand total, fiscal year 1940.....	4,278,550	1,450,000	² 5,728,550
Grand total, fiscal year 1939.....	4,106,700	2,100,550	6,207,250

¹ Does not include 61,100 cubic yards of rehandled and overcast material.

² In addition 28,005 cubic yards of Chamé sand produced by the craneboat *Atlas*.

Dredging operations are divided into three major districts: the northern district, from contour 42 feet below mean sea level in the Atlantic Ocean to Gamboa; the central district, Gaillard Cut, from Gamboa to Pedro Miguel locks; the southern district, from Pedro Miguel locks to contour 50 feet below mean sea level in the Pacific Ocean. Excavation in these three districts is summarized as follows:

	Northern	Central	Southern	Total
Canal prism:	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Earth.....	3, 127, 900	410, 500	132, 100	3, 670, 500
Rock.....	85, 300	1, 066, 800	142, 800	1, 294, 900
Total.....	¹ 3, 213, 200	1, 477, 300	274, 900	4, 965, 400
Auxiliary:				
Earth.....	29, 550		59, 700	89, 250
Rock.....	152, 000		3, 100	155, 100
Total.....	181, 550		62, 800	244, 350
Total:				
Earth.....	3, 157, 450	410, 500	191, 800	3, 759, 750
Rock.....	237, 300	1, 066, 800	145, 900	1, 450, 000
Grand total:				
Fiscal year 1940.....	3, 394, 750	1, 477, 300	337, 700	² 5, 209, 750
Fiscal year 1939.....	3, 236, 300	2, 365, 400	1, 200	² 5, 602, 900

¹ 61,100 cubic yards of rehandled and overcast material not included.

² Does not include Chagres River gravel or Chame sand service.

ORDINARY CHANNEL MAINTENANCE

Northern district (Atlantic entrance, Cristobal Harbor and Gatun Lake).—Maintenance dredging in the Atlantic entrance was performed by the dipper dredge *Cascadas* and the suction dredge *Las Cruces*, working a total of 165 dredging days. The total amount of material excavated was 2,150,800 cubic yards. Maintenance dredging in Cristobal Inner Harbor was carried on by the dipper dredge *Cascadas* working $1\frac{1}{4}$ dredging days excavating 3,000 cubic yards of material. On the Cristobal Outer Harbor the dipper dredge *Cascadas* worked $14\frac{1}{2}$ days, excavating a total of 36,600 cubic yards. Maintenance dredging in Gatun Lake was performed by the dipper dredges *Cascadas*, *Gamboa*, and *Paraíso*, and the suction dredge *Las Cruces*, working an aggregate of $129\frac{1}{2}$ dredging days. The total amount of the material excavated was 1,089,500 cubic yards.

Central district (Gaillard Cut).—Maintenance dredging in Gaillard Cut (exclusive of slide excavation) amounted to 506,400 cubic yards of earth, with the three dipper dredges *Cascadas*, *Gamboa*, and *Paraíso* working a total of $199\frac{1}{2}$ days.

Southern district (Pacific entrance, Balboa Harbor and Miraflores Lake).—Maintenance dredging in the Pacific entrance was performed by the dipper dredge *Cascadas* and the craneboat *Atlas*, working a total of 25 dredging days and excavating 37,100 cubic yards of material. The *Atlas*, equipped with a clam shell bucket, excavated 1,700 cubic yards of material from the East Ferry Slip. Maintenance dredging in Miraflores Lake was carried on by the suction dredge *Las Cruces* and the craneboat *Atlas*. A total of $9\frac{1}{2}$ days was worked by the two dredges in excavating a total of 58,000 cubic yards of material. There was no maintenance work performed in the Balboa Harbor during the year.

SPECIAL MAINTENANCE PROJECTS

Project No. 1.—This project consists of deepening the Pacific entrance channel from Miraflores Locks to the sea buoys, and includes Balboa Harbor. Dredging on this project was carried on during the year by the dipper dredge *Cascadas*. The *Cascadas* operated a total of 68 days and excavated 179,800 cubic yards of material. The drill boat *Terrier No. 2* worked a total of 154½ days during the year on this project, drilling a total of 2,958 holes and breaking 62,000 cubic yards of rock. At the end of the past fiscal year excavation on the Pacific entrance portion of project No. 1 was 95.9 percent completed. There was no work done on project No. 1, Balboa Harbor, during the year.

Project No. 8, Gatun Locks Approach.—This project involves the widening of the existing channel at the lower end of the Gatun Locks, in order to provide additional maneuvering room for ships entering or leaving the locks, and also to increase the facility of discharging water from the locks. Work on this project was begun in February 1940 by the suction dredge *Las Cruces*, which worked three days removing a total of 34,000 cubic yards of material. Excavation on this project was 25 percent completed at the end of the year.

Project No. 11.—This project, which consists of removing various shoal areas in the outer portions of Cristobal Harbor, was started in September 1934. There was no work performed on this project during the year. The Washington Shoals portion of this project (project No. 11-A) was completed in the fiscal year of 1939, leaving project No. 11-B, the removal of 3 shoals in West Limon Bay, to be accomplished.

Project No. 13, Gaillard Cut.—This project, which consists of widening Culebra Reach by 200 feet to the westward, was started in January 1935. Dredging on this project was continued with the three dipper dredges *Cascadas*, *Gamboa*, and *Paraiso* working an aggregate of 155½ days and excavating 543,400 cubic yards of material. The total excavation to date on this project is 2,537,550 cubic yards, and the excavation was 32.3 percent completed at the close of the past fiscal year.

SLIDES

Total excavation from slides in Gaillard Cut during the fiscal year amounted to 427,500 cubic yards. Slide activity generally throughout the Cut was markedly less than for previous years. Culebra slide (west) was the only slide of consequence during the year. The movement of this slide was of a slow continuous character throughout the year, though somewhat less than last year. The active movement on this slide was confined to the period of July to October, inclusive, during which there were four distinct accelerated movements. Dredging operations were practically continuous on this

slide from July to December. There was no interference with shipping on account of slides during the year.

Details of the excavation from slides during the fiscal year 1940, together with the total material excavated from June 30, 1913, to the end of the past fiscal year, are presented in the following table:

Location	Fiscal year 1940			Total to date		
	Earth	Rock	Total	Earth	Rock	Total
	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Haut Obispo slide (east).....	0	0	0	6,700	5,500	12,200
Buena Vista slide (west).....	0	0	0	7,000	1,500	8,500
Buena Vista slide (east).....	0	0	0	12,100	17,550	29,650
Cascadas slide (east).....	0	0	0	9,250	49,900	59,150
White House slide (east).....	0	0	0	30,250	46,050	76,300
White House slide (west).....	0	0	0	21,000	100,550	121,550
Powder House slide (west).....	0	0	0	115,250	343,450	458,700
La Pita slide (east).....	0	0	0	12,300	96,700	109,000
La Pita slide (west).....	0	0	0	4,550	42,900	47,450
Empire slide (east).....	0	0	0	40,550	237,950	278,500
Lirio slide (east).....	0	0	0	83,850	161,300	245,150
Division Office slide (west).....	0	0	0	4,150	19,450	23,600
Lirio slide (west).....	0	0	0	570,450	1,987,750	2,558,200
Culebra slide (east).....	0	0	0	2,785,250	18,142,750	20,928,000
Culebra slide (west).....	83,700	289,700	373,400	2,129,000	11,732,650	13,861,650
Culebra slide extension (east).....	10,000	19,800	29,800	455,700	1,027,750	1,483,450
Barge Repair slide (east).....	11,000	13,300	24,300	219,750	488,150	707,900
Contractors Hill (north).....	0	0	0	15,600	148,100	163,700
Contractors Hill (west).....	0	0	0	7,900	31,600	39,500
Cucaracha slide (east).....	0	0	0	2,492,950	6,851,400	9,344,350
Cucaracha Signal Station slide (west).....	0	0	0	36,600	206,000	242,600
South Cucaracha slide (east).....	0	0	0	61,550	131,700	193,250
Cucaracha Village slide (east).....	0	0	0	33,400	77,400	110,800
Paraiso slide (east).....	0	0	0	1,950	7,250	9,200
Cartagena slide (west).....	0	0	0	60,800	255,150	315,950
Total.....	104,700	322,800	427,500	9,217,850	42,210,450	51,428,300

Numerous small bank breaks and surface movements occurred during the year at various points throughout Gaillard Cut. Daily inspections were made of all portions of active slide areas fronting the Canal, as well as a periodical inspection of the entire surface of all slides. Monthly observations were taken of reference points on east and west Culebra, east Culebra extension, Cucaracha, South Cucaracha, and Cartagena slides.

SUBSIDIARY DREDGING DIVISION ACTIVITIES

The Gamboa gravel plant shipped 212,005 cubic yards of sand and gravel during the year, as compared with the normal yearly output of approximately 50,000 cubic yards. This increase is due to the increased need of sand and gravel for the various construction projects on the Canal Zone. The pipe line suction dredge *Las Cruces* together with necessary auxiliary equipment was engaged a total of 77 days on dredging operations in connection with gravel production, pumping into the stock pile at Gamboa 293,800 cubic yards of run-of-bank gravel. The craneboat *Atlas* spent 56 days during the year making 28 trips to Chamé in the dredging and hauling of 28,005 cubic yards of Chamé sand. This material was transported in barges to Balboa.

The Canal and adjacent waters through Gaillard Cut, Miraflores Lake, and Gatun Lake (including all dump areas) were patrolled and the growth of hyacinths kept under control. Log booms at the mouth of the Chagres and Mandingo Rivers were maintained to prevent hyacinths, logs, floating islands, and other obstructions from entering the Canal channel during freshets or spilling at Madden Dam. During the year periodical inspection trips were made in the Chagres, Mandingo, Frijoles, and Azules Rivers, and along the shores of Barro Colorado Island, Peña Blanca, and Gigante Bays, dumps Nos. 1 to 14, and Miraflores and Red Tank Lakes. Weekly inspection trips were also made of the Canal channel between Gamboa and Gatun.

An estimated 415 cords of driftwood were picked up along the banks of the Canal in Gaillard Cut and Gatun Lake and in Miraflores and Red Tank Lakes. The trash-handling plant removed approximately 53 cords of driftwood from the Chagres River.

EQUIPMENT

The following dredges and other floating equipment were in operation during the year: The 15-yard dipper dredges, *Cascadas*, *Gamboa*, and *Paraiso*, were operated a total of 10.8 months, 4.8 months, and 7.4 months, respectively. The 24-inch pipe-line suction dredge *Las Cruces* was operated for 11.1 months during the year. The craneboat *Atlas* was operated for 0.5 month on general maintenance dredging and, in addition, spent 1.8 months dredging sand and making 28 trips to Chamé. It spent the remainder of the year in miscellaneous operations, 2.9 months of this time being spent in reserve and under repairs. Derrick barge *No. 157* was in service 4.7 months during the year, under repairs for 0.4 month, and was standing by at the Reserve Fleet tie-up station in Gatun Lake at Gamboa for 6.9 months. The hydraulic grader *No. 4* was in service 7.5 months at project No. 13 in Gaillard Cut and Bas Obispo quarry, under repairs for 0.7 month, and standing by 3.8 months. The drill boat *Terrier No. 2* was in service during the entire year, except for the 1.85 months lost because of boiler-washing operations and repairs. Air compressor *No. 29* was in service 11.75 months during the year at project No. 13. Excavator *No. 1* was in service 4.7 months, being engaged in dike construction for gravel stock pile at Gamboa, and for United States Navy fill at Coco Solo and in loading rock at Fort Kobbe quarry in connection with repairs to West Ferry Slip breakwater. Excavator *No. 2* was in actual service 4.8 months during the year, being engaged in the loading of run-of-bank gravel at Gamboa stock pile, as well as on the construction of the gravel stock pile dike. The 250-ton floating cranes *Ajax* and *Hercules* were operated alternately during the year except when calls for extra service required both cranes. Three

large tugs, the *Trinidad*, *Chagres*, and *Gatun*, supplemented by the *Mariner* and *Bohio* and the two small tugs *Indio* and *Siri*, were operated during the year in general towing and transportation service, one large tug being out of commission continuously for purpose of repairs. Ten launches were in service during the greater part of the year. An average of two launches was continuously out of service for repairs. The Diesel ferry boats *President Roosevelt* and *Presidente Amador* were in service in connection with the operation of Thatcher Highway ferry service at Balboa for 10.45 months and 12.0 months, respectively, during the year.

FERRY SERVICE

Ferry service across the Pacific entrance of the Canal, connecting La Boca, Balboa, and Panama City on the east bank of the Canal with Thatcher Highway on the west bank, was operated on a continuous 24-hour basis throughout the year. Traffic at the Thatcher Ferry showed a sharp increase in volume in 1940 over 1939 due to the inauguration of United States Army construction projects on the west side of the Canal. The total number of vehicles carried during the fiscal year 1940 was 39.2 percent in excess of that of the preceding year, and the number of passengers carried 38.8 percent in excess of that of last year. In the following table are shown the more important statistics relative to the operation of the ferry for the past 2 fiscal years:

	1940	1939
Single trips made by the 2 ferries.....	44,023	33,017
Vehicles carried:		
Panama Canal vehicles.....	24,049	13,083
U. S. Army vehicles.....	69,199	36,904
Commercial trucks.....	42,889	41,420
Commercial passenger cars.....	93,748	67,168
Private cars.....	281,324	208,731
Total vehicles carried.....	511,209	367,306
Total passengers carried.....	2,459,311	1,771,884

MARINE ACTIVITIES

Effective early in the past fiscal year, certain measures were inaugurated to safeguard the Canal, such as having all ships inspected by a Navy boarding party and special forms submitted and passed on by the proper authorities before transit could be granted. Armed guards were also placed on board vessels by the Army during the transit and other safety precautions enforced. The single culvert operation put into effect at Pedro Miguel Locks on December 27, 1939, and continued throughout the year, necessitated a change in the method of dispatching vessels for transit and occasionally, in

order to prevent undue delay to shipping, 24-hour service was maintained in the Canal.

AIDS TO NAVIGATION

The maintenance of aids to navigation was continued throughout the past fiscal year. There were a number of improvements and adjustments made in the lights, buoys, beacons, and other navigational aids maintained for the benefit of vessels operating in the Canal and adjacent waters. Experiments were continued during the year on trans-Isthmian and ship-to-shore radio-telephone communication to facilitate the dispatching of vessels and their control during transit.

ACCIDENTS TO SHIPPING

The board of local inspectors investigated and reported on 33 accidents to shipping in Canal Zone waters during the fiscal year 1940, a summary of which follows with a comparison of accidents in the past 2 previous years:

Cause of accident	1940	1939	1938
Ship struck dock	8	4	3
Ship damaged by tug	7	6	4
Ship struck lock wall	6	7	5
Ship struck Canal bank	3	2	4
Ship grounded	2	4	1
Ship struck Canal equipment	1		
Ship struck mooring buoy	1		
Ship struck Cristobal breakwater	1		1
Ship struck Canal craneboat	1		1
Collision	1	2	1
Sinking	1		
Chocks damaged in locks	1		
Other causes		2	5
Total	33	27	23

SALVAGE AND TOWING

Panama Canal equipment and personnel rendered assistance to disabled and distressed shipping during the year as follows:

Motor-ship Copiapo.—The Chilean motor-ship *Copiapo* in the general passenger and cargo trade between New York and Valparaiso struck the inner end of the west breakwater at the entrance to the Cristobal harbor, seriously damaging her hull and flooding the two forward holds. The U. S. S. *Favorite* and lighthouse subdivision equipment were engaged in salvage operations on the damaged vessel.

Yacht White Shadow.—The tug U. S. *Gorgona* made a trip to sea to render assistance to the *White Shadow*, a small yacht owned by the United Fruit Co. and en route from Golfito, Costa Rica, to Balboa with a crew of 14 and 3 passengers. The yacht managed to arrive at Balboa without assistance of the tug, which stood by, due to heavy weather, to render aid if necessary.

METEOROLOGY—HYDROLOGY—SEISMOLOGY

Precipitation.—Rainfall in the Canal Zone and vicinity for the calendar year 1939 averaged slightly below normal with the deficiency most marked in the Pacific section. The average in the Pacific section was 65.01 inches; in the central section, 95.56 inches; and in the Atlantic section, 137.21 inches. Annual totals at rainfall stations ranged from 62.64 inches at Balboa Heights to 156.70 inches at Porto Bello. February was the month of least rainfall and November of greatest rainfall. The maximum rainfall in 24 consecutive hours during the calendar year 1939 was 9.40 inches at Barro Colorado Island in Gatun Lake on November 6 and 7.

Air temperature.—The mean air temperature in the Canal Zone for the calendar year 1939 was slightly above normal. The annual mean at Balboa Heights was 79.2° F., with monthly means ranging from 77.2° in February to 81.1° in April. The annual mean at Cristobal was 80.3°, with monthly means ranging from 79.2° in February to 82.0° in May. The means and extremes at various stations for the calendar year 1939 are shown in the following table:

Station	Maximum		Minimum		Annual bihourly mean
	°F.	Date	°F.	Date	
Balboa Heights.....	95	Apr. 25	67	Feb. 23	79.2
Madden Dam.....	96	May 8	60	Apr. 2	76.8
Gatun.....	94	May 9	70	do.....	80.2
Cristobal.....	91	June 11	72	Dec. 6	80.3

The absolute maximum and minimum temperatures on record at various stations up to June 30, 1940, are given below:

Station	Length of record (years)	Absolute maximum		Absolute minimum		Annual average
		°F.	Date	°F.	Date	
Balboa Heights.....	34	97	Apr. 7, 1912	63	Jan. 27, 1910	78.7
Madden Dam.....	29	98	Apr. 13, 1920	59	{Feb. 24, 1924 Jan. 30, 1929}	77.1
Gatun.....	29	95	{May 21, 1925 May 4, 1933}	66	Aug. 7, 1912	80.3
Cristobal.....	32	95	{Oct. 18, 1924 May 21, 1925}	66	Dec. 3, 1909	80.0

Winds and humidity.—Monthly mean wind velocities on the Pacific coast during the calendar year 1939 ranged from 4.4 miles per hour in September to 10.3 miles per hour in March, with a maximum velocity for a 5-minute period of 35 miles per hour from the south on July 23. Monthly mean wind velocities on the Atlantic coast ranged from 5.8 miles per hour in September to 14.8 miles per hour in March, with a maximum velocity for a 5-minute period of 35 miles per hour from the

west on December 6. Northwest winds were most frequent on the Pacific coast and north winds on the Atlantic coast. The mean relative humidity for the calendar year 1939 was 80 percent on both coasts, which is somewhat below normal. Monthly mean relative humidity on the Pacific coast ranged from 70 percent in March to 86 percent in August. Monthly mean relative humidity on the Atlantic coast ranged from 72 percent in February to 86 percent in November.

Tides.—During the calendar year 1939 the following extreme tidal heights occurred at Balboa, the Pacific terminal of the Canal: Highest high water, 9.9 feet above mean sea level on August 18, September 15 and 16, and December 6; lowest low water, 11.7 feet below mean sea level on February 6; and the greatest range between consecutive tides, 21.1 feet on February 6. At Cristobal, the Atlantic terminal of the Canal, the following extremes occurred: Highest high water, 1.40 feet above mean sea level on December 6; lowest low water, 0.95 foot below mean sea level on January 9 and June 16; and the greatest range between consecutive tides, 1.78 feet on January 5.

Seismology.—There were 231 seismic disturbances recorded at the Balboa Heights seismological station during the calendar year 1939, of which 142 were too slight and indistinct to classify, 18 were definitely of distant origin, and the remaining 71 were of comparatively nearby origin with epicenters distant less than 300 miles. Eight of the nearby shocks were of sufficient intensity to be felt by local residents. Ninety-six seismic disturbances were recorded during the 6-month period, January to June 1940. Only one was sufficiently strong to be felt by local residents. No tremors occurring during the calendar year 1939 or during the first 6 months of 1940 exceeded intensity III on the Modified Mercalli Scale, and none caused any damage locally.

SECTION II

BUSINESS OPERATIONS

The business enterprises carried forward by the Panama Canal and by the Panama Railroad Co. embrace a number of activities which in the United States would normally be carried on by private initiative. These activities have been developed either to meet the needs and demands of shipping passing through the Canal, or to meet the needs of the organization and its force of employees. The business enterprises include those sections which are engaged in the supplying of fuel, provisions, ship chandlery, and repairs to vessels; the sale of foods, clothing, and other essentials to Canal and Railroad employees; the handling of cargo and allied operations; and the operation and management of the Panama Railroad and of the steamship line operating between New York and the Isthmus.

The Canal and the Railroad are separate organizations, but the administration of both organizations is vested in the Governor of the Panama Canal, who is also President of the Panama Railroad Co.

PANAMA CANAL BUSINESS OPERATIONS

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels, and the government of the Canal Zone. The annual appropriation acts for the Panama Canal authorize for expenditure and reinvestment all moneys received from the conduct of auxiliary business activities with the proviso that any net profit derived from such business activities shall annually be covered into the Treasury of the United States.

It is the aim to operate the business activities as a whole on a self-supporting basis and to include as a charge against business operations a fixed capital charge of 3 percent (with some minor variations) as interest on the investment. In the accounting of profits to be covered into the Treasury, the amount representing charges for interest on investment is a part of the net profits covered into the Treasury and is in effect a reimbursement to the United States Treasury for interest paid by it to holders of United States bonds. The investment in business activities totaled \$35,061,078.25 at the beginning of the fiscal year, and \$37,448,541.54 at the end (tables 4 and 5, sec. V). The capital charge for the fiscal year 1940 was \$808,207.64 (table 20, sec. V). The profits of \$1,033,886.06 exceeded this amount by \$225,678.42.

MECHANICAL AND MARINE WORK

The volume of work performed for the Panama Canal, which is the principal item in the mechanical division shops, showed an increase of \$2,738,322 as compared with the preceding fiscal year. The total volume of work for all interests was \$6,063,962, an increase of \$2,935,894 as compared with last year.

The value and class of work done in 1940, and the sources of the same, as compared with the preceding year, are shown in the following table:

Gross revenue—class and source

	Fiscal year 1940	Percent of total	Fiscal year 1939	Percent of total
Class:				
Marine	\$1,547,773	25.5	\$1,548,058	49.5
Railroad	461,876	7.6	435,782	13.9
Fabricated stock	211,571	3.5	237,307	7.6
Sundries	3,842,742	63.4	906,921	29.0
Total	6,063,962	100.0	3,128,068	100.0
Origin:				
Panama Canal	4,416,518	72.8	1,678,164	53.6
Panama Railroad	490,982	8.1	458,902	14.7
Other United States departments	607,604	10.0	414,833	13.3
Outside interests	548,858	9.1	576,169	18.4
Total	6,063,962	100.0	3,128,068	100.0

Operating expenses for the fiscal year totaled \$6,003,682, leaving a net revenue from operations of \$60,280.

The marine work listed above includes construction of new vessels for the Canal and overhaul of vessels for the Canal, the United States Navy, and other departments of the United States Government, as well as merchant ship repairs.

DRYDOCKS

During the year 120 drydockings were made at the Balboa and the Cristobal drydocks, further details of which are given below:

Vessels belonging to—	Balboa drydock	Cristobal drydock
Panama Canal divisions	22	6
U. S. Navy	2	16
U. S. Army	4	6
Other departments of the U. S. Government	0	2
Panama Railroad Co.	1	5
Outside interests	30	26
Total	59	61

The Balboa drydock was unoccupied only 8 days out of the year, while the Cristobal drydock was unoccupied 106 days. In the fiscal year 1939 the Balboa drydock was unoccupied only 10 days and the Cristobal drydock 63 days.

MARINE REPAIR WORK

The volume of marine repair work performed for commercial shipping interests was somewhat less than in preceding years. The decline in this work is attributable in part to the decrease in shipping through the Canal.

Probably the most unique job performed by the marine repair forces during the year was the dismantling and reassembling of the Navy Floating Drydock, YFD-2. This large steel drydock, formerly a part of the equipment of the New Orleans Navy Yard, was en route to the Hawaiian Islands by way of the Panama Canal. In its assembled form, the dock was too wide to pass through the lock chambers. It was necessary, therefore, to dismantle it, pass it through the Canal, and then reassemble it for the remainder of the voyage. The job of dismantling and subsequent reassembling was performed by forces from the Cristobal and Balboa shops of the mechanical division, aided by divers from the Coco Solo Naval Station.

Repairs to commercial vessels consisted principally of emergency repairs to vessels transiting the Canal, or to small craft operating between the Canal and ports in South and Central American countries. A number of vessels in need of underwater repairs, such as damaged propellers or broken tail shafts, were drydocked.

Marine work performed for vessels of the United States Army and Navy during the year was limited to general repairs and overhauling of craft based in local waters. No job of an unusual nature in connection with Army or Navy craft arose, as was occasioned last year by the drydocking of two of the larger United States Navy's battle-ships.

Marine repair work for vessels of foreign governments was exceptionally light during the year, work being done for only two Colombian destroyers and one Colombian transport ship.

As facilities became available from time to time throughout the year, a number of the units of the dredging and marine divisions of the Panama Canal were drydocked and overhauled. Several new pieces of equipment, built in the mechanical division shops, were completed and turned over to these divisions.

WORK OTHER THAN MARINE WORK

Light and heavy repairs on locomotives of the Panama Railroad Co. were carried out as needed. This class of work was somewhat reduced in volume and cost in comparison with last fiscal year, due to placing 5 new locomotives in service. This new equipment lessened the amount of heavy repairs formerly necessitated by the worn out condition of the old locomotives.

A considerable volume of millwork, including sash and doors, door-frames, windowframes and molding was manufactured for use in the

construction of new quarters and public buildings in the various towns of the Canal Zone. Large quantities of mahogany logs were sawed into merchantable lumber for local Panamanian lumber dealers and landowners.

PLANT IMPROVEMENTS

New checking-in sheds for laborers and other employees were constructed at both Balboa and Cristobal shops for the purpose of facilitating the identification of all personnel entering and leaving the shops area. Numerous improvements were carried out throughout the buildings and grounds, such as the installation of electric refrigerated drinking fountains, the construction of new pavement and the extension of paved and working areas. Two 30-ton Diesel operated locomotive cranes were purchased and placed in use; one at Cristobal and one at Balboa. Several new machine tools were added during the year.

ELECTRICAL INSTALLATION AND REPAIR WORK

The principal activities of the electrical division are as follows: The operation and maintenance of the power system; the operation and maintenance of telephone, telegraph, electric clock, fire alarm, printing telegraph, and railway signal systems; the operation and maintenance of the street lighting system; and the installation and maintenance of such electrical equipment as is required by the Panama Canal and other Government agencies, or by vessels undergoing repairs at the Canal terminals. Following is a comparison of the various expenditures of the electrical division for the past 2 fiscal years:

Expenditures	1940	1939
Maintenance and operation of power system	\$638,409	\$582,040
Construction and maintenance of electric work	1,831,477	796,223
Maintenance and operation of telephones	135,982	126,481
Maintenance and operation of railway signals	41,286	41,219
Total	2,647,154	1,545,963

Details of the actual construction and maintenance performed for the power system may be found on page 32 of this report, under the general heading of Canal operation, while operating statistics of the telephone system are covered on page 57 under the operations of the Panama Railroad Co. The total of \$2,647,154 shown above for gross expenditures is not a correct total of primary expenses, as it includes several elements of duplication. As an example, maintenance and repairs on the power system are performed by the electrical work unit and hence this direct element of expense is included in the expenses of both the power system and the electric work.

PURCHASES AND INSPECTIONS IN THE UNITED STATES

The principal purchases of supplies for the Panama Canal were made by the Washington office, as heretofore. Branch offices with assistant purchasing agents in charge were continued at New York and San Francisco. The Panama Canal medical section, New York general depot, United States Army, Brooklyn, N. Y., continued, as heretofore, to make purchases of the principal medical and hospital supplies used by the Panama Canal on the Isthmus.

The assistant purchasing agents at New York and San Francisco and the assistant freight-traffic manager at New Orleans of the United Fruit Co. have acted as receiving and forwarding agents for material and supplies delivered at and through their respective ports for transshipment to the Isthmus.

The preliminary inspection of materials in the United States covering purchases, the delivery of which is required on the Isthmus (which constitutes the large majority of purchases), and final inspection of materials delivered in the United States are made by the force of inspectors in the field under the supervision of the inspecting engineer of the Panama Canal at Washington, assisted by the officers of the Corps of Engineers, United States Army; the Bureau of Standards; the Bureau of Mines; the Bureau of Chemistry, Department of Agriculture; the Medical Department, United States Army; the Bureau of Construction and Repair; and the Bureau of Engineering, Navy Department.

The volume of purchases made through the Washington office of the Panama Canal is indicated by the summary following:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Number of purchase orders placed.....	¹ 12,463	8,582	8,198
Value of orders placed.....	\$17,719,486	\$4,543,924	\$4,281,979
Aggregate of purchases since 1904 made through Washington office.....	\$260,478,013	\$242,758,527	\$238,214,603
Number of disbursement vouchers prepared.....	14,842	11,002	12,128
Value of above vouchers.....	\$14,742,058	\$4,061,710	\$5,322,678
Number of collection vouchers prepared.....	330	316	308
Value of above vouchers.....	\$242,179	\$164,324	\$281,993
Cash discounts taken.....	\$126,563	\$12,291	\$49,119
Realized from sales of surplus material.....	\$40,912	\$348	\$90

¹ Largest number of orders placed during any fiscal year since 1904, when construction work on the Canal was begun.

STOREHOUSES AND SHIP CHANDLERY

In addition to its main function of requisitioning, storing, and issuing general supplies for the Canal and Railroad (exclusive of the merchandising operations of the commissary division), the Canal Zone storehouses handled sales of ships' chandlery and other supplies to commercial shipping as well as to units of the United States Army and United States Navy. The following statistics cover the more important operative features of the storehouse during the past 3 years:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Gross revenues—sales and issues	\$14,149,657	\$5,399,289	\$5,334,905
Cost of material, plus operating expenses	14,069,415	5,361,776	5,264,415
Net revenues	71,212	37,513	70,490
Inventory as of June 30	\$5,290,310	\$4,642,917	\$4,982,868
Scrap and obsolete stock on hand, June 30	\$18,020	\$15,344	\$19,156
Number of steamship sales	1,931	1,736	1,773
Steamship sales value	\$67,560	\$45,796	\$61,213
Scrap metal sold in local market	tons 96	175	412
Scrap metal sold for export	do 0	0	6,454

OBsolete AND UNSERVICEABLE PROPERTY AND EQUIPMENT

During the year disposition was made by sale, or by destruction where the items had no money value, of obsolete or unserviceable property and equipment which had an original value of \$386,172. Replacements were made as necessary.

FUEL OIL, DIESEL OIL, GASOLINE, AND KEROSENE

All deliveries of the products listed above to and from tanks for private companies, as well as for the Panama Canal and the United States Navy, are handled through pipe lines and pumping plants of the Panama Canal.

The following table summarizes the operation of the fuel oil handling plants for the past 3 years:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Fuel and Diesel oil:	<i>Barrels</i>	<i>Barrels</i>	<i>Barrels</i>
Handled at Mount Hope (Atlantic side)	7,144,984	5,179,455	3,754,037
Handled at Balboa (Pacific side)	5,317,363	3,858,500	3,733,629
Total barrels handled	12,462,347	9,037,955	7,487,666
Received by the Panama Canal	303,845	168,707	272,034
Used by the Panama Canal	249,157	203,643	214,021
Sold by the Panama Canal	36,337	28,009	37,424
Miscellaneous transfers on tank farm	24,004	38,074	15,257
Pumped for outside interests	11,879,004	8,599,522	6,948,930
Total barrels handled	12,462,347	9,037,955	7,487,666
Number of ships discharging or receiving fuel or Diesel oil:	<i>Number</i>	<i>Number</i>	<i>Number</i>
Panama Canal craft	165	109	141
All others	2,290	2,063	1,903
Total	2,455	2,172	2,044
Gasoline and kerosene:	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Bulk gasoline received	5,534,611	3,736,203	3,927,821
Bulk kerosene received	1,490,682	1,139,617	1,491,106
Financial result of operations:			
Total revenues	\$821,125	\$617,173	\$621,614
Total expenditures (including cost of sales)	777,372	511,376	593,305
Net revenues	43,753	105,797	28,309

BUILDING CONSTRUCTION AND MAINTENANCE

The principal projects of building construction work completed by the constructing quartermaster's division during the past year were as follows:

Cristobal.—Erection of motorcar repair shop and checking-in shed; erection of six buildings for family quarters.

Gatun.—Erection of silver labor receiving station and eight buildings for family quarters.

Gamboa.—Erection of new Panama Railroad station; construction of field office for dredging division and one 16-apartment building for quarters.

Pedro Miguel.—Erection of new Panama Railroad station; barracks for lock guards.

Ancon-Balboa.—Erection of field plant for constructing quartermaster; general office building for Panama Railroad Co.; nurses' quarters; checking-in shed, Balboa shops area; addition to Balboa dispensary; 37 buildings for family quarters.

Diablo Heights.—Erection of office building for special construction division; 200-man mess hall and kitchen; commissary; 35 buildings for family quarters.

All others.—Erection of ward at Palo Seco; barracks for lock guards, Miraflores; soils and structural laboratory, Miraflores; barracks and mess hall for United States Navy; bathhouse for Far Fan Beach; drafting room, Miraflores.

In addition to the new construction, expenditures for maintenance and repair work during the past year aggregated \$853,598, of which \$350,800 was expended on maintenance of quarters for gold employees and \$126,838 on maintenance of quarters of silver employees, the balance of \$375,960 having been expended on all other maintenance work performed by the constructing quartermaster division.

The total volume of construction and maintenance work for the past 3 years is summarized as follows:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
For Canal division:			
Repair and maintenance work.....	\$643, 499	\$649, 630	\$665, 604
Construction work.....	4, 090, 527	1, 463, 052	1, 381, 667
For the Panama Railroad Co.:			
Repair and maintenance work.....	94, 375	63, 229	41, 930
Construction work.....	195, 671	5, 540	46, 643
For other departments of the Government, employees and others...	128, 631	64, 921	58, 056
Total.....	5, 152, 703	2, 246, 372	2, 193, 900
Total maintenance.....	853, 598	777, 779	765, 590
Total construction.....	4, 299, 105	1, 468, 593	1, 428, 310
Total.....	5, 152, 703	2, 246, 372	2, 193, 900

QUARTERS FOR EMPLOYEES

Gold employees.—A total of 78 new buildings, totaling 691 apartments, was erected during the year for the purpose of providing additional family quarters. For the greater part, these were multiple apartment houses of a special type designed to provide small, two-room

apartments to employees temporarily added to the organization in connection with the design and construction of the third locks and other special projects.

The large number of new employees brought to the Isthmus has made the housing situation for families of employees much more acute than last year. Notwithstanding the construction of the large number of additional quarters, on June 30, 1940, there were 650 applicants awaiting assignment to family quarters, of whom 351 were employees in the regular organization and the remaining 299 were temporary employees.

Regulations governing assignments to quarters were amended during the year as follows:

On original assignments to all types of quarters, applicants were given credit for all previous service with the Panama Canal and Panama Railroad Co.

A special application list was established for employees recruited in the United States for third locks and special projects with a view to giving these employees preference in assignments to certain types of quarters.

Silver employees.—The operation of silver quarters was continued on the same basis as in previous years. New construction for the year consisted of two 12-family quarters at Cristobal and a dormitory in the police station at Gamboa for bachelors. A number of barracks and mess buildings are being constructed for third lock employees at different locations, but no family quarters for third lock silver employees will be provided by the Canal. The demand for quarters from employees on the silver roll is far in excess of the supply, there being 1,655 applications on file in all districts as of June 30, 1940.

More than 50 percent of the operating forces on the silver rolls of the Canal and Railroad have been living in the cities of Colon and Panama for the past several years. Due to the large increases in forces during the past year, the percentage of those living outside the Zone has increased to more than 65 percent of the total.

REPLACEMENT OF QUARTERS FOR AMERICAN EMPLOYEES

About 13 years ago cost records indicated that the expense of maintaining the oldest frame quarters for American employees had reached the point where replacement was the most economical procedure. A survey showed some of these old quarters were built by the French Canal Co. and by the Panama Railroad Co. before the United States acquired the Canal Zone in 1904. There were also in use a large number of construction camp type of frame houses built during the first years of American operations and large numbers of similar houses built prior to 1915. Some of these were reerected houses which had been moved from towns that were abandoned upon completion of construction work. It was realized that their replacement would require an extensive construction program over a period of years. The

matter was placed before Congress and the first appropriation for replacement of quarters for American employees was made for the fiscal year ended June 30, 1927.

The first types of quarters designed and built for the permanent force were of concrete. On account of the large first cost of concrete buildings, designs were resorted to of concrete column and first-floor beams with wood frame structure above. After experience in the construction and maintenance of various types of houses, and after giving consideration to original cost, upkeep, etc., the wooden structures supported on concrete beams have been adopted as standard, and are preferred by a majority of the employees.

Family quarters on the regular replacement program constructed in 1940 comprised 49 apartments—12 at Gatun, 16 at Gamboa, and 21 at Ancon-Balboa. The following table shows the number of apartments for American employees' quarters which were to be replaced as of June 30, 1926, the replacements by years up through 1940 and the balance of the original program remaining to be replaced after the fiscal year 1940:

Number of apartments for American employees' quarters

[Status of replacement program as of June 30, 1940]

Locations	Cristobal, New Cris- tobal, Colon Beach		Gatun		Gamboa		Pedro Miguel		Ancon- Balboa		Total	
	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor
Total number to be re- placed June 30, 1926:												
Family.....	347		148				135		468		1,098	
Bachelor.....		276		23				60		401		1 760
1927.....	49										49	
1928.....	80										80	
1929.....	65								10		75	
1930.....	16								30	40	46	40
1931.....	1								70		71	
1932.....	46								25		71	
1933.....	10	100							12		22	100
1934.....	1		15						10		26	
1935.....			50	32					1		51	32
1936.....			57		26	24					83	24
1937.....					37	12					37	12
1938.....					52						52	
1939.....		16	22						29		51	16
1940.....			12		16				21	64	49	64
Total replacements:												
Family.....	268		² 156		³ 131				208		763	
Bachelor.....		116		⁴ 32		³ 36				104		288
Remaining to be replaced after 1941:												
Family.....	79						4		260		335	
Bachelor.....		160						24		297		472

¹ Reduced from 831 to 760 by the chief quartermaster July 15, 1937, due to less demand for bachelor quarters.
² Gatun replacement of old apartments has been accomplished. The additional 8 apartments over the number listed in 1926 are used for increased personnel on account of 40-hour week and increased activities.

³ The quarters built at Gamboa will replace quarters at Pedro Miguel and in other districts.

⁴ Includes 9 additional bachelor quarters required at Gatun on account of increase in lock force because of 40-hour week.

MOTOR TRANSPORTATION

The transportation division is charged with the operation and maintenance of all motor and animal transportation furnished the departments and divisions of the Panama Canal and Panama Railroad Co. The centralization of all transportation facilities in this division and the requirement that it operate on a self-sustaining basis has been primarily for the purpose of supplying needed transportation at a minimum cost to the Panama Canal and Panama Railroad Co. Revenues during the past year totaled \$668,349 and expenses \$655,948, which left a net revenue of \$12,401. A considerable amount of heavy hauling in connection with various building and highway construction projects was accomplished during the year.

During the year 155 cars and trucks were purchased, and 31 cars and trucks were retired. At the close of the fiscal year 489 cars and trucks, 4 trailers, and 6 motorcycles were on hand.

PANAMA CANAL PRESS

The operations of the Panama Canal Press were continued under the same policy as heretofore. The printing plant carries stocks of materials, and prints such forms, stationery, etc., as are required on the Isthmus in connection with the operation of the Panama Canal and the Panama Railroad. It is also charged with the printing of the official publication, *The Panama Canal Record*. The following statistics summarize the operations of this plant during the past 2 years:

	Fiscal year 1940	Fiscal year 1939
Gross revenues.....	\$300,180	\$235,299
Total output expense (includes supplies not processed in the printing plant).....	275,647	221,213
Net revenue.....	24,533	14,086
Inventory on hand, June 30.....	104,885	76,687

REVENUES DERIVED FROM THE RENTAL OF LANDS IN THE
CANAL ZONE

Rentals on building sites and oil-tank sites in the Canal Zone totaled \$45,438 for the year, as compared with revenues of \$44,390 for the fiscal year 1939. Rentals of agricultural land in the Canal Zone totaled \$10,460, as compared with \$10,668 for the preceding year. At the close of the fiscal year 1,000 licenses were in effect, covering 1,990 hectares of agricultural land within the Canal Zone. This is a reduction of 78 in the number of licenses under the previous fiscal year and a reduction in the area held under licenses of 141½ hectares. This reduction is largely the result of the policy adopted in May 1935, providing that as a health measure no more licenses for agri-

cultural land would be issued and that holdings under licenses previously granted cannot be sold or transferred.

BUSINESS OPERATIONS UNDER THE PANAMA RAILROAD CO.

The Panama Railroad Co. was incorporated in 1849 under the laws of the State of New York for the purpose of constructing and operating a railroad across the Isthmus. When the concession, rights, and property of the New French Canal Co. were purchased in 1904, the stock of the Panama Railroad Co. became the property of the United States Government. Since the acquisition of the railroad by the United States, its corporate status has been preserved and the railroad has continued to function as a common carrier.

At the beginning of canal construction work, by Executive order of the President of the United States, the Panama Railroad Co. was made an adjunct to the Panama Canal. Its operations are supervised by a board of directors functioning under the direction of the Secretary of War. As the operations of the railroad complement those of the Canal, the policy has been for the Board of Directors to elect the Governor of the Panama Canal as President of the Panama Railroad Co. Thus, the Governor of the Panama Canal is the administrative head of the Panama Railroad Co. This practice has insured complete coordination of the activities conducted by the two organizations.

As the activities of the railroad company are covered in detail in its annual report, only the major features of operation as they relate to Canal administration are covered in this section.

In addition to the operation of the trans-Isthmian railroad, the business enterprises conducted by the Panama Railroad Co. include the following: A steamship line operating between New York and the Isthmus; the loading, unloading, storage, and transfer of cargo for shipping interests at the terminal ports; the operation of wholesale warehouses, retail stores, and subsidiary manufacturing plants engaged in the supply of food, clothing, and other essential commodities to governmental agencies, employees, and their families; the operation of coaling plants, hotels, a dairy, and a laundry.

Business operations on the Isthmus, carried on by the Panama Railroad Co., yielded a profit of \$2,497,073 for the fiscal year 1940, as compared with \$1,481,847 for the previous fiscal year, an increase of \$1,015,226. The increased revenue was due to increased volume of business, but a substantial part of this was offset by increased capital expenditures required to meet demands of the additional business.

TRANS-ISTHMIAN RAILROAD

The railroad line operates between Colon at the Atlantic terminus and Panama City at the Pacific terminus. In addition to these cities, it serves all nearby activities of the Panama Canal. Gross revenues

from the operations of the railroad proper (not including subsidiary business activities) during the fiscal year 1940 amounted to \$2,165,938. Revenue freight totaled 600,877 tons, as compared with 323,233 tons during 1939, an increase of 277,644 tons.

During the past year orders were placed for 5 new steam and 5 new Diesel-electric locomotives and for 50 new freight cars. These will replace equipment that is now over 30 years old. By the end of the year the 5 new steam locomotives had been delivered and were undergoing final tests in service on the Isthmus. The Diesel-electric locomotives and the freight cars were scheduled to arrive in the early part of the fiscal year 1941.

Statistics covering the various features of railroad operations during the past 3 years are presented in the following table:

	1940	1939	1938
Average miles operated, Colon to Panama	47.61	47.61	47.61
Gross operating revenue	\$2,165,938	\$1,601,804	\$1,600,748
Number of passengers carried:			
First-class	152,909	159,911	159,574
Second-class	294,083	207,348	199,323
Total	446,992	367,259	358,897
Revenue per passenger-train mile	\$1.41	\$4.08	\$3.42
Revenue per freight-train mile	\$14.65	\$12.08	\$12.63
Passenger-train mileage	149,644	132,324	142,257
Freight-train mileage	104,751	71,114	68,524
Work-train mileage	4,204	6,043	13,916
Total train mileage	258,599	209,481	224,697
Switch locomotive miles	114,504	106,134	103,290

RECEIVING AND FORWARDING AGENCY

This division handles the dock and harbor activities of the Panama Railroad Co. at the two terminals of the Canal. The following statistics summarize operations for the past 3 years:

	1940	1939	1938
Total revenue	\$2,508,749	\$1,936,016	\$1,898,086
Cargo handled and transferred	<i>Tons</i> 2,062,020	<i>Tons</i> 1,580,859	<i>Tons</i> 1,530,287
Cargo stevedored	797,356	615,530	617,137
Total	2,859,376	2,196,389	2,147,424
Cargo ships handled	4,187	4,898	4,601
Banana schooners handled	1,273	1,211	1,326
Agency service furnished vessels	85	89	106

COALING PLANTS

Gross revenues from coal sales during the past fiscal year amounted to \$928,024 as compared with \$557,921 in 1939. Sales of coal for the

fiscal year 1940 were the highest for any fiscal year since 1931. The following statistics summarize the operations of the coaling plants at Cristobal and Balboa for the past 3 fiscal years:

	1940	1939	1938
Gross revenues.....	\$928, 024	\$557, 921	\$767, 126
Coal sold.....	<i>Tons</i> 118, 219	<i>Tons</i> 70, 487	<i>Tons</i> 103, 844
Coal purchased.....	148, 024	49, 199	124, 884

TELEPHONES AND TELEGRAPHS

The gross revenue from the operation of telephones, electric clocks, and electric printing telegraph machines amounted to \$257,554.

During the year 1,948 telephones were installed or reconnected and 1,608 were discontinued or removed, resulting in a net increase of 340 for the year. At the end of the fiscal year there were 50 electric clocks and 24 automatic printing telegraph typewriters in service. Local and long distance telephone calls handled through the automatic exchanges averaged 66,621 calls per day in 1940 as compared with 54,403 calls per day in 1939. This was a daily average of about 21.7 calls per telephone.

REAL ESTATE OPERATIONS

Real estate operations of the Panama Railroad Co. cover property owned by the company in the cities of Colon and Panama and buildings erected by the company in the Canal Zone. At the close of the fiscal year 1940 a total of 1,596 leases and 15 licenses were in effect covering the use of the Panama Railroad properties in the cities of Panama and Colon. During the past year 2,099 square meters of land in the city of Panama, not needed for business purposes, were sold.

A disastrous fire took place in the city of Colon on the night of April 13, 1940. This fire involved an area of 24 city blocks, 13 of which were completely destroyed and the improvements on the remaining 11 blocks were partially destroyed. The fire affected 207 lots owned by the company, on which 270 buildings were destroyed, or so badly damaged either by fire or dynamiting as to require rebuilding. In order to encourage and expedite the construction of new buildings within the burned area, substantial concessions in the remission of rent for periods up to 1 year are being made to those lessees who actually begin construction of new buildings not later than July 1, 1941.

COMMISSARY DIVISION

The primary function of the commissary division of the Panama Railroad Co. is to maintain adequate stocks of food, clothing, and household supplies to meet the needs of Government personnel and the

various United States Government departments on the Isthmus. In carrying out this function the division operates retail stores in each of the Canal Zone towns, and also central wholesale and cold storage plants. Sales are restricted to agencies and personnel of the United States Government, except that ice, cold storage, food, and other essentials may be purchased by commercial steamships transiting the Canal or calling at its terminal ports.

Net sales for the year totaled \$12,291,266, as compared with \$8,897,317 for the previous fiscal year. The value of merchandise on hand June 30, 1940, was \$1,663,740 as compared with \$1,137,050 at the close of the fiscal year 1939. The ratio of sales to inventory indicates a theoretical stock turnover of several times a year. The distribution of sales for the past year as compared with the 2 preceding years was as follows:

	1940	1939	1938
U. S. Government (Army and Navy)	\$2,890,768	\$1,450,032	\$1,286,237
The Panama Canal	1,222,434	839,953	823,936
The Panama Railroad	358,217	262,395	273,139
Individuals and companies	351,361	353,048	270,259
Commercial ships	297,478	307,342	327,944
Employees	8,024,283	6,221,731	6,054,100
Gross sales	13,114,541	9,434,501	9,035,615
Less discounts, credits, etc.	853,275	537,184	517,373
Net sales	12,291,266	8,897,317	8,518,242

PURCHASES

Purchases during the year aggregated \$9,824,203, an increase of \$3,266,552 as compared with the previous year. The following tabulation shows the value of the various classes of materials purchased, as compared with the 2 preceding years:

	1940	1939	1938
Groceries	\$2,809,511	\$1,893,472	\$1,861,179
Candy and tobacco	441,293	357,943	325,061
Housewares	544,147	365,359	340,051
Dry goods	1,255,192	911,704	829,161
Shoes	372,400	248,127	212,065
Cold storage	2,057,722	1,188,344	1,175,048
Raw materials	680,201	490,288	418,734
Cattle and hogs	281,234	220,202	201,178
Milk and cream	273,413	236,844	224,883
Dairy products	1,109,060	645,368	560,390
Total	9,824,203	6,557,651	6,150,750

HOTELS

The Hotels Tivoli and Washington were operated by the Panama Railroad Co. without change of policy. These hotels are an essential adjunct of the Canal, providing suitable accommodations to foreign visitors, American tourists, visiting Government officials, and others.

The gross revenue from hotels was \$395,126, as compared with \$308,399 in 1939, and the number of guest days was 67,006 as compared with 43,744 in 1939.

MINDI DAIRY

The operation of the Mindi Dairy continued as in previous years. Milk production for the year totaled 445.656 gallons, as compared to 417,947 gallons in the preceding year, an increase of 27,709 gallons. Fresh milk was supplied the Army and Navy units stationed on the Isthmus in addition to employees and units of the Canal and Railroad organizations. Buildings and pastures were maintained in good condition by the dairy operating force.

PANAMA LINE

The gross operating revenue for the steamship line for the fiscal year ended June 30, 1940, amounted to \$3,141,294.04, and the gross operating expenses amounted to \$3,026,340.68, resulting in a net profit from operations of \$114,953.36. The operating profit compared with the net loss for the fiscal year ended June 30, 1939, of \$87,005.35, shows an increase in the net revenue of \$201,958.71.

For the year ended June 30, 1940, the tonnage carried by the steamship line amounted to 317,141 tons, as compared with 210,728 tons in the previous year.

The steamship line carried freight and passengers for account of the Panama Canal and other departments of the Government of the United States at material reductions from tariff rates, which amounted to the important sum of \$931,750.13. Had regular tariff rates been received by the steamship line for such freight and passenger services performed for the Panama Canal and other Government departments, its income would have been increased by \$931,750.13, and its operations for the year would have resulted in a profit of \$1,046,703.49.

SECTION III

ADMINISTRATION

DEPARTMENTS

The organization of the Panama Canal on the Isthmus embraces five principal departments, namely, operation and maintenance, supply, accounting, executive, and health. In addition to this, an office of the Panama Canal is maintained in Washington, D. C. The Panama Railroad Co., a Government-owned corporation conducting business enterprises on the Isthmus, is a distinct unit, yet it is closely affiliated with the Canal organization.

OPERATION AND MAINTENANCE

The department of operation and maintenance embraces functions related to the actual use of the Canal as a waterway, including the dredged channel, locks, dams, aids to navigation, and statistics of navigation, accessory activities such as shops and drydocks, vessel inspection, electrical and water supply, sewer systems, roads and streets, hydrographic observations, surveys and estimates, and miscellaneous construction other than the erection of buildings.

SUPPLY

The supply department is charged with the accumulation, storage, and distribution of materials and supplies for the Panama Canal and Railroad; the maintenance and construction of buildings; the assignment of living quarters to employees and care of grounds; the operation of storehouses, fuel-oil plants, an experiment garden, and a printing plant, and the supplying of motor transportation facilities to the various departments and divisions of the Canal and Railroad organizations.

ACCOUNTING

The accounting department is responsible for the correct recording of financial transactions of the Canal and Railroad; the administrative auditing of vouchers covering the receipt and disbursement of funds preliminary to the final audit by the General Accounting Office; cost keeping of the Canal and Railroad; the checking of timekeeping; the preparation of estimates for appropriations and the allotment of appropriations to the various departments and divisions; and the examination of claims.

EXECUTIVE

The executive department embraces the general office business of the Governor and all administrative activities invested by Executive order within the authority of the executive secretary. Under this department come the administration of police and fire protection, postal service, customs, shipping-commissioner work, estates, schools, general correspondence, and records for the organization of the Canal and Panama Railroad, personnel records and administration, wage adjustments, information and publicity, relations with Panama, and the operation of clubhouses, restaurants, moving-picture theaters, playgrounds, etc.

HEALTH

The health department has jurisdiction over all matters pertaining to sanitation and public health within the Canal Zone and the cities of Panama and Colon, the operation of hospitals and dispensaries, and the enforcement of quarantine regulations.

PANAMA RAILROAD COMPANY

The operations of the Panama Railroad Co. on the Isthmus are generally related closely to the work of the Canal. As the Governor of the Panama Canal is President of the Panama Railroad Co., the heads of departments of both the Canal and Railroad organizations report to him. The general administration of the composite organization is centered in the executive office, and the accounting work in the accounting department; the Panama Railroad and the business divisions of the Canal organization are billed for their proper share of the general overhead work.

CHANGES IN ADMINISTRATIVE PERSONNEL

Appointments in official positions during the fiscal year 1940 were as follows:

Mr. Frank H. Wang was appointed executive secretary on March 1, 1940, vice Cloyd A. McIlvaine, retired.

Mr. Paul A. Bentz was appointed general counsel on March 1, 1940, vice Frank H. Wang, appointed executive secretary.

Mr. B. F. Burdick was appointed Chief of Office and General Purchasing Officer on April 24, 1940, vice Mr. H. A. A. Smith, deceased.

Col. Morrison C. Stayer, United States Army, was appointed chief health officer on September 2, 1939, vice Col. Henry C. Pillsbury, United States Army, relieved from duty with the Panama Canal.

Lt. Col. Thomas B. Larkin, United States Army, was appointed assistant to the Governor on September 11, 1939, and was appointed supervising engineer in charge of the special construction division on September 25, 1939.

CHANGES IN ADMINISTRATIVE ORGANIZATION

Special construction division.—This division was established effective September 25, 1939, in charge of a supervising engineer who reports to the engineer of maintenance.

The safety section.—This section was established in the department of operation and maintenance effective April 26, 1940, and reports to the supervising engineer of the special construction division.

The special engineering section.—Effective July 22, 1939, the special engineering section became the special engineering division.

Section of surveys transferred.—Effective May 1, 1940, that part of the section of surveys concerned principally with surveying was transferred to the section of office engineer as a subsection of that organization. The remainder of the section of surveys was redesignated the section of meteorology and hydrography and headed by a chief hydrographer, reporting to the assistant engineer of maintenance.

Central labor office.—Effective September 1, 1939, a unit designated as the central labor office was established in the division of personnel supervision and management to assist in coordinating the local employment of native labor by the various activities of the United States Government.

PERSONNEL ADMINISTRATION

Continued progress was made in the development of files of local applicants and better coordination was effected with the Washington office with respect to employment procedure and the development of applications for various types of employment on the Isthmus. As of June 30, 1940, there was on file a total of 12,641 applications for employment on the gold roll of the Panama Canal and Railroad organizations, of which 11,367 were from the United States, 788 local civilians, 452 from personnel of the Army, Navy, and Marine Corps, and 34 from Central and South America, not including Panama. There were also 314 applications for transfer from employees holding permanent or temporary positions with the Panama Canal and 167 applications for Canal employment from among the civilian employees of the Army, Navy, and Marine Corps. This made a grand total of 13,122 applications on file at the end of the fiscal year, as compared with 1,733 for the same period in the preceding year.

EMPLOYEES

The force employed by the Panama Canal and the Panama Railroad Co. is composed of two classes which for local convenience have been designated "gold" and "silver" employees. The terms "gold" employees and "silver" employees originated during the construction period of the Canal from the practice of paying common laborers and other unskilled or only semiskilled workers employed in the Tropics

in silver coin, while skilled craftsmen and those occupying executive, professional, and similar positions were paid in gold coin, the latter group being recruited largely from the United States. Although all employees are now paid in United States currency, the original terms used to designate the two classes of employees have been retained for convenience. The terms "gold" and "silver" are applied also to quarters, commissary, clubhouse, and other public facilities.

The gold employees—that is, those carried on the gold pay roll—are, with a few exceptions, citizens of the United States and comprise those employees who are engaged in the skilled trades and in the executive, supervisory, professional, subprofessional, clerical, and other positions where education, training, and special qualifications are required. The force of silver employees is composed almost entirely of natives of the Tropics, a considerable number of whom are Panamanians. The force of silver employees is composed principally of laborers, helpers, and semiskilled workers who perform work which does not require the services of specially trained or qualified persons.

Panama Canal employees are divided, therefore, into two general classes, one of which comprises United States citizens, and the other principally native tropical labor. These two classes are carried on separate pay rolls and the conditions of employment applicable to each differ materially. The division of labor between the two classes of employees is a matter of long custom in tropical countries and Panama Canal practice conforms to this general custom.

GOLD EMPLOYEES

The distribution of the gold personnel on June 5, 1940, and June 7, 1939, is shown in the following tabulation:

	June 5, 1940	June 7, 1939	Increase	Decrease
THE PANAMA CANAL				
Accounting department.....	221	177	44	-----
Dredging division.....	235	187	48	-----
Assistant engineer of maintenance:				
Electrical division.....	294	189	105	-----
Locks division.....	329	288	41	-----
Municipal division.....	674	120	554	-----
Office engineer.....	176	62	114	-----
Surveys—Meteorology.....	25	21	4	-----
Executive department:				
Executive offices.....	220	147	73	-----
Bureau of Posts.....	95	80	15	-----
Civil affairs and customs.....	27	16	11	-----
Clubs and playgrounds.....	90	72	18	-----
Collector.....	16	16	-----	-----
Fire protection.....	49	48	1	-----
Magistrates' courts.....	4	4	-----	-----
Paymaster.....	16	12	4	-----
Police and prisons.....	186	169	17	-----
Schools.....	146	143	3	-----
Fortifications division.....	3	3	-----	-----
Health department.....	386	310	76	-----
Marine division.....	216	196	20	-----
Mechanical division.....	586	447	139	-----
Special engineering division.....	180	42	138	-----

	June 5, 1940	June 7, 1939	Increase	Decrease
THE PANAMA CANAL—continued				
Supply department				
Offices, chief quartermaster	15	12	3	
Constructing quartermaster	215	85	130	
District quartermasters	31	25	6	
Experiment garden	6	3	3	
Fuel oil plant	39	38	1	
Motor car repair shop	45	34	11	
Motor transportation	104	42	62	
Panama Canal Press	14	11	3	
Storehouses	74	53	21	
Total, the Panama Canal	4,717	3,052	1,665	
PANAMA RAILROAD CO.				
General manager	128	110	18	
Receiving and forwarding agency	117	96	21	
Commissaries	270	224	46	
Dairy farms	4	1		
Hotels	14	15		1
Estate section	8	10		2
Total, Panama Railroad Co.	541	459	85	3
Total force	5,258	3,511	1,750	3

From the foregoing table it may be seen that there has been a net increase of 1,747 in the number of gold employees on the rolls of the Panama Canal and the Panama Railroad Co. This is an increase of practically 50 percent and with a few minor exceptions it may be seen in every unit of the organization. This is the direct result of the great volume of construction activity now being carried on locally, on national defense projects. Thus, by far the largest increase is in the municipal engineering division, which now has a gold force more than five times as great as it had a year ago. Other large increases can be noted in the design forces, the office engineer and the special engineering division, and in other units related to construction activities, such as the electrical division, the mechanical division, the constructing quartermaster, and the motor transportation division. Because of the general increase in activity it has likewise been necessary to increase the force in numerous other units, not actually engaged in construction work, such as the accounting department, the health department and the commissaries. The increase in the executive offices is largely in the personnel division and was caused by the increased work required to handle the additional employments necessitated by construction activities.

RECRUITING AND TURN-OVER OF FORCE—GOLD EMPLOYEES

The following table shows additions to and separations from the gold force in the fiscal year from July 1, 1939, to June 30, 1940. Employments are classified as made in the United States or on the Isthmus, and separations are classified by cause:

Gold force	Operation and maintenance	Executive	Supply	Health	Accounting	Panama Railroad Co.	Total
Employed or reemployed in the United States.....	897	63	134	74	-----	35	1,203
Employed or reemployed on the Isthmus.....	478	176	164	62	39	71	990
Total additions.....	1,375	239	298	136	39	106	2,193
Resigned.....	122	51	25	49	7	26	280
Retired:							
Age.....	24	5	4	1	2	1	37
Disability.....	9	5	4	2	2	4	26
Voluntary.....	6	2	1	-----	-----	2	11
Died.....	10	7	4	-----	-----	2	23
Discharged:							
Reduction of force.....	3	1	-----	-----	-----	-----	4
Expiration of temporary employment.....	12	16	3	11	-----	-----	42
Cause.....	15	1	9	2	-----	4	31
Other reasons.....	9	7	1	-----	-----	-----	17
Total separations.....	210	95	51	65	11	39	471

NOTE.—The above figures do not include 106 employments made on a part-time basis and 40 terminations of part-time employees; neither does it include 62 employments of citizens of the United States on the silver roll and 32 terminations of citizens of the United States on the silver roll.

The Panama Canal:		Panama Railroad Co.:	
Additions.....	2,087	Additions.....	106
Separations.....	432	Separations.....	39
Net additions.....	1,655	Net additions.....	67

Based on an average aggregate gold force of 4,380 for the year, the 471 separations shown above give a turn-over of 10.75 percent from all causes, as compared with a turn-over rate of 11.74 percent for the fiscal year 1939, which was based upon an average of 3,456 employees with 406 separations. The turn-over rate when discharges by reason of expiration of temporary employment are excluded is 9.79 percent for the fiscal year 1940, as compared with 7.4 percent for the fiscal year 1939.

The Washington office of the Panama Canal tendered employment, on requisition above the grade of laborer, to 2,604 persons, as against 642 the previous year. A total of 1,545 accepted tenders and were appointed, covering 136 classes of positions. This is nearly 6 times as many as in the previous fiscal year when 266 appointments were made. This increase was occasioned by the increased construction activities being carried out on the Canal Zone by the Panama Canal and the United States Army and Navy. A total of 5,708 persons, including new appointees, employees returning from leave of absence, and members of their families, were provided transportation from the United States to the Isthmus. This is an increase of 1,669 over the previous year. Of those to whom transportation was provided during the past year 5,016 came from New York, 370 from New Orleans, 11 from other Atlantic coast ports, 307 from Pacific coast ports, and 4 by way of air-transport service.

WAGE ADJUSTMENTS

The Panama Canal Act provides that compensation for Panama Canal employees fixed thereunder "shall in no instance exceed by more than 25 percent the salary or compensation paid for the same or similar service to persons employed by the Government in continental United States." The usual policy is to pay to United States citizens employed on the gold roll the full 25 percent differential above pay for similar work in Government employment in the United States, within the limit of appropriations.

SILVER EMPLOYEES

The numbers of employees on the silver roll by departments and divisions, as shown on force reports for June 1940 and June 1939, are given in the following tabulation. These summaries cover the number of employees on the specific days on which the force reports were compiled (the first Wednesday of the month), and are believed to be fairly representative for most of the divisions. In some divisions the number of employees at work may change by several hundred within a short time, according to variations in the demand for hourly rated labor. The summary shows only those at work on June 5, 1940, and June 7, 1939.

	June 5, 1940	June 7, 1939	Increase	Decrease
THE PANAMA CANAL				
Accounting department.....	3	2	1	
Dredging division.....	1, 178	884	294	
Assistant engineer of maintenance:				
Electrical division.....	429	230	199	
Locks division.....	773	685	88	
Municipal division.....	4, 768	1, 494	3, 274	
Office engineer.....	11	6	5	
Surveys—Meteorology.....	86	56	30	
Executive department:				
Executive offices.....	54	41	13	
Bureau of posts.....	22	20	2	
Civil affairs and customs.....	1	1		
Clubs and playgrounds.....	702	323	379	
Magistrates' courts.....	3	2	1	
Paymaster.....	2	2		
Police and prisons.....	47	46	1	
Schools.....	119	119		
Health department.....	1, 010	842	168	
Marine division.....	506	602		96
Mechanical division.....	1, 100	902	198	
Special engineering division.....	147	28	119	
Supply department:				
Constructing quartermaster.....	2, 615	978	1, 637	
District quartermaster.....	408	381	27	
Experiment garden.....	167	29	138	
Fuel-oil plant.....	60	53	7	
Motor-car repair shop.....	63	49	14	
Motor transportation.....	262	132	130	
Panama Canal Press.....	95	74	21	
Storehouses.....	472	272	200	
Total, the Panama Canal.....	15, 103	8, 253	6, 946	96
PANAMA RAILROAD CO.				
General manager.....	515	560		45
Receiving and forwarding agency.....	1, 105	889	216	
Commissaries.....	1, 852	1, 243	609	
Dairy farm.....	124	113	11	
Hotels.....	189	185	4	
Real-estate section.....	3	3		
Total, Panama Railroad Co.....	3, 788	2, 993	840	45
Total force.....	18, 891	11, 246	7, 786	141

From the above table it may be seen that there has been a net increase of 7,645, or 69 percent, in the number of silver employees on the rolls of the Panama Canal and Panama Railroad Co. As explained under the heading of gold employees on page 63 of this report this increase is the direct result of the construction activity now being carried forward. The two principal increases are in the municipal engineering division, which performs the large construction projects, except buildings, and in the constructing quartermaster's division, which handles building construction. The decrease noted under the general manager of the Panama Railroad is due to completion early in the fiscal year 1940 of the program of reballasting the main line of the railroad.

SILVER WAGES

Wages of employees on the silver roll bear no direct relationship to wages of corresponding classes of workers in the United States. As these employees are for the most part natives of the Tropics, their wage scales are established at levels based on wages prevailing for tropical labor in the Caribbean area.

SILVER ELIGIBILITY AND EMPLOYMENT PROGRAM

During the fiscal year 1940 there were 16,789 silver applicants for employment regularly scheduled for interview and physically examined, an increase of 750 percent over the previous year. Of these, 1,194 were rejected for various causes, while 15,595 were made eligible for permanent employment. An additional 5,054 applicants were made eligible for temporary employment, bringing the total to 20,649 applicants whose eligibility was established during the fiscal year. This is nearly 10 times as great as the previous year's eligibility figure.

The eligibility work of the past year brought the total number of those interviewed and examined under the procedure to 26,760 at the close of the year. Of this number, 25,957 were made eligible or found still eligible, and 803 were disqualified or found ineligible because of physical disability or other causes. Of those made eligible or found still eligible, 24,069 were at some time in employment and 2,691 remained unemployed during the year.

Total employments verified during the year totaled 23,262; placements therefore averaged 1.1 times the eligibilities established. Total terminations verified during the same period were 9,384, approximately 40 percent of eligibilities established.

A survey of available labor in the interior of Panama was made recently in conjunction with the labor office of the Republic of Panama to determine the class and amount of labor still available on the Isthmus. The survey indicated that while there seemed to be some labor still available in the interior, there was a general reluctance to

leave home and come to the Zone. Under the circumstances, it must be assumed that the local labor supply interested in Canal Zone employment has been practically exhausted. Exhaustion of the local supply of semiskilled native labor necessitated the establishment, in February, of a recruiting office in Jamaica. By June 30, 1940, that office had contracted and forwarded to the Zone 150 Jamaican workers.

REPATRIATIONS

Under an act approved in fiscal year 1934, an appropriation of \$150,000 was provided by Congress for the purpose of repatriating unemployed West Indians and their families who have rendered at least 3 years' service with the United States Government or the Panama Railroad Co. on the Isthmus. During the fiscal year 1940, approximately \$2,434 was expended for the repatriation and rehabilitation of 45 former employees, accompanied by 26 members of their families, a total of 71 persons. To date, a grand total of \$54,200 has been expended for the repatriation of 722 former employees accompanied by 664 members of family, giving a grand total of 1,386 individuals. The average cost per person for repatriation has been \$39.11 and the average cost per employee \$75.07. It is believed that the decrease in repatriation for the current year is due to the heavy demand for labor on the Isthmus.

CASH RELIEF FOR DISABLED EMPLOYEES

As the result of the development to conclusion of the initial large influx of applications for relief under the act of Congress of July 8, 1937, the cash relief program during the fiscal year 1940 tapered off to a presumed state of normalcy. Applications for consideration were received at an average rate of 15 per month. The original system established during the latter part of the fiscal year 1938 for administering this program remains basically without change. A few minor restrictive regulations have been adopted, however, to insure adherence to the intent of the act in its strictest sense.

The tables below show the disposition of all applications from employees of both the Panama Canal and the Panama Railroad Co. from the inception of this function. The gross and net amounts of the pay rolls are also indicated.

Applications	Panama Canal	Panama Railroad	Total
Applications received to June 30, 1940, inclusive	760	221	981
Applications approved for payment	439	104	543
Applicants died before cash relief was approved	20	8	28
Applications suspended for various reasons	8	6	14
Applications rejected for various reasons	13	5	18
Applicants ineligible because of limitations of the act	268	91	359
Applications not complete but in various stages of progress	12	7	19
Total	760	221	981

NOTE.—Removals from the rolls on account of the death or subsequent reemployment of cash relief recipients: Panama Canal, 66; Panama Railroad, 13.

Total and average costs

	Number of cases	Monthly average payment per case	Monthly pay roll as of June 30, 1940
Panama Canal rolls.....	373	\$17. 19	\$6, 412. 50
Panama Railroad rolls.....	91	15. 70	1, 429. 50
Total.....	464	16. 90	7, 842. 00

Expenditures on behalf of the Panama Canal cash-relief program are paid from annual allotments for that purpose, while those of the Panama Railroad Co. constitute a continuation of the former system of granting cash-relief to the superannuated employees of that company and are made from Panama Railroad funds. At the beginning of the fiscal year 1940 cash relief payments were being made to 233 former employees of the Panama Railroad Co. Of this number 75 died or were otherwise separated from the roll, leaving a balance of 158 at the end of the fiscal year. These are not included in the statistics above which include only those employees granted cash-relief under the plan now in effect. The expenditure of the Panama Railroad for the payment of cash considerations to both the superannuated employees and those employees who were awarded cash-relief under the act of Congress of July 8, 1937, amounts to \$39,031 for the fiscal year.

EXPERIMENT GARDENS

The Canal Zone plant introduction gardens and experimental station were established in June 1923. The gardens which include greenhouses, nurseries, and experimental plantings, embrace approximately 125 acres of land, and are devoted to the propagation and cultivation of a wide variety of useful and ornamental plants from all parts of the world, primarily for the purpose of determining their adaptability and value under local soil and climatic conditions for the general propagation on the Isthmus.

The construction of new residential area and town sites brought about by the increased activities on the Canal, as well as the expansion of the United States Army and United States Navy posts, has increased the work of the experimental gardens. In order to obtain greater efficiency in carrying out the landscape program of the Canal, the landscape unit was reestablished to take over all landscape work in connection with the new construction program. Aside from carrying out the work of the Canal, outside advice and assistance was rendered to the Army and Navy in the arrangement of landscape planting for their new expansion.

In cooperation with the Bureau of Plant Industry, United States Department of Agriculture, a reference collection of sugarcane

varieties of the world was established at the experimental gardens in April 1939. The principal purpose of the study is to determine the full range of natural variation with this collection used as a basis for developing useful new types of hybridization. This work was continued through the year, with studies being made in the development of disease-resistant sugarcane. This study is now practically complete with five different varieties having been developed and made practically immune. These are high in sugar content and grow luxuriantly in this region. Many of the sugar plantations in Panama are now growing nothing but disease-resistant varieties of cane.

Originally the experiment gardens were supported by rents from the agricultural land leases. However, due to a policy of gradually eliminating such leases in the interest of health and sanitation, the income from that source has materially decreased, and a small appropriation has been made for the partial support of the garden since the fiscal year 1934. The cost of landscape work done in connection with new construction and for the Army and Navy and the Department of Agriculture is reimbursed to the gardens through work requests issued for such work.

CLUBHOUSES AND PLAYGROUNDS

During the construction of the Panama Canal, recreational and welfare activities for Canal employees were conducted by the Y. M. C. A. with the financial support of the United States Government. These activities when carried forward into the permanent organization were placed under the bureau of clubs and playgrounds. Eventually many diversified activities, such as kindergartens, physical education, motion pictures, restaurants, soda fountains, candy and cigar stands, etc., were assigned to the bureau. Due to the expansion in activities, some of which were of a business or commercial character, in January 1936, after a detailed study, the activities of the bureau were subdivided into two units as follows:

(a) The clubhouse subdivision which operates restaurants, soda fountains, newsstands, candy and cigar counters, moving-picture theaters, billiard and pool rooms, bowling alleys and swimming pools, and in which the patronage is restricted to Government personnel and their families. This subdivision is self-supporting and no appropriations are required for the activities carried forward.

(b) The playground subdivision, maintained with appropriated funds, which provides facilities for outdoor recreation and promotes and supervises such activities as physical education, playground activities, basketball, baseball, handball, football, tennis, boxing, fencing, archery, athletic meets, pageants, etc.

CLUBHOUSE SUBDIVISION

As private industry is not permitted in the Canal Zone, the Government is under the obligation of operating restaurants, motion-picture theaters, and other activities for which there is a community demand.

A considerable number of these activities is under the clubhouse subdivision of the bureau of clubs and playgrounds for the reason that their centralization under one roof greatly facilitates administration and tends toward a lowering of operating costs. Along with the operation of swimming pools the clubhouses furnish instruction in swimming and lifesaving to the local community.

There were no important changes in the prices or in the general clubhouse management policies during the past fiscal year. Restaurant revenues increased by 70 percent because of the great influx of new employees. Sales at the tobacco and merchandise counters increased by 30 percent and motion-picture revenues increased by 20 percent, all as compared with the preceding fiscal year.

Several of the buildings now used to house the facilities of this bureau are very old wooden structures that have already outlasted their economic lives. Some of these originally had been erected in construction towns of the Canal Zone and toward the end of the construction period were dismantled and reerected on their present sites. It was recognized at the time that these facilities were in the nature of a more or less temporary arrangement, but they were satisfactory and their replacement was not advocated because of the more urgent needs of the Canal. Several of these old wooden buildings are now in a badly deteriorated condition and require heavy maintenance expenditures; the time is approaching when they will no longer be adequate and when it will be necessary to replace them with permanent structures.

SUBDIVISION OF PLAYGROUNDS

When the United States Government embarked upon the Canal project in 1904, it was necessary to bring many thousands of employees from the United States and from the West Indies to the Isthmus. In the absence of proper recreational facilities in the Canal Zone, or in the cities of Panama and Colon under Panamanian jurisdiction, the Government embarked upon the policy of providing wholesome amusement and recreational facilities in each of the Canal Zone villages, similar to those provided in the District of Columbia and by many communities in the States, and likewise corresponding with those provided by foreign corporations operating in the Tropics.

Climatic conditions on the Isthmus and the ever-present danger of contracting malaria, dysentery, and other tropical diseases, when recreation is sought outside of the sanitated areas adjacent to the zone villages, make the matter of providing adequate recreational facilities to Government personnel and their families of considerably greater importance than in communities in the States. In the absence of such facilities many employees undoubtedly would seek diversion and entertainment in unhealthy and undesirable ways and places.

The appropriation for playground activities covers the salaries of

physical directors and directresses, kindergarten teachers, and playground attendants, and also provides funds for the maintenance of playgrounds, playsheds, ball diamonds, tennis courts, running tracks, and similar facilities, and for the purchase of playground and physical education equipment. Some of the recreational activities are partially self-supporting, but they cannot be made wholly so without greatly curtailing their scope and thus lessening the benefits now being derived through their extensive use.

The physical instructors and other personnel employed in the playground unit, in cooperation with the division of schools, have charge of the physical education program for all grammar, high school, and junior college students in the Canal Zone schools; conduct kindergartens for children of Government employees; and furnish active leadership and guidance to such organizations as the Boy Scouts, Girl Scouts, Sea Scouts, etc.

The recreational facilities provided by the playground subdivision are used extensively, not only by the civilian employees and their families, but also by the United States defense forces stationed on the Isthmus. Practically all facilities are utilized to their capacity during visits of units of the United States Navy. The cost of these physical and recreational facilities is more than repaid in increased efficiency and morale of the organization and in the improved general welfare and health of the entire Canal Zone population. There is ample justification for the continuation of reasonable expenditures, such as have been made in the past.

The new playshed at Cristobal, which was under construction at the end of the previous fiscal year, was completed and opened for use. This provided a new gymnasium and playshed for the Cristobal gold playgrounds and was used extensively throughout the past fiscal year. A site for a playground in old Cristobal was approved and this area will soon be enclosed and developed.

LEGISLATION

The most important piece of permanent legislation relating to the Panama Canal and the Canal Zone which was enacted during this fiscal year was the act to amend the Canal Zone Code, Public, No. 626—Seventy-sixth Congress, approved June 13, 1940. Section 1 of that act amended section 10 of title 2 of the Canal Zone Code, relative to injuries to vessels, and so forth, occasioned by the operation of the Canal.

The amended section requires the President to provide by regulation for the prompt adjustment and payment by the Governor, subject to certain limitations, of damages for injuries to vessels, or to the cargo, crew, or passengers of vessels which may arise (a) by reason of the passage of such vessels through the locks of the Canal, or (b) by reason

of the presence of such vessels in the waters of the Canal Zone, other than the locks, when the Governor shall find that the injury was proximately caused by negligence or fault on the part of any officer or employee of the Panama Canal acting within the scope of his employment. The Governor is forbidden, however, to adjust and pay any claim for damages occasioned outside the locks the amount of which claim exceeds \$60,000, and must submit such claims to Congress with his report and recommendations. In the case of claims arising in the locks, a claimant who considers himself aggrieved by the Governor's determination or award may bring an action on the claim in the District Court for the Canal Zone. With this exception the section forbids actions against the United States or the Panama Canal or any officer or employee of the Panama Canal, for damages for injuries arising in connection with the operation of the Canal and by reason of the presence of a vessel in the waters of the Canal Zone. The substantial purposes effected by this amendment are to cover injuries to crew members, to provide direct statutory authority for the adjustment and payment of claims for damages for injuries arising outside of the locks, and generally to clarify and render definite and certain the subject matter of the section.

Section 2 of the aforesaid act restates and amends the sections of the Canal Zone Code relative to the Canal Zone postal service. The general purposes achieved by the amendments were to provide the means for clarification and rendering more definite the general administrative regulations applying to the service, and to provide more specific authority in reference to the custody, safeguarding, and investment of postal money order and postal saving funds. The sections provide for a system of postal savings deposits in lieu of the former system of postal money orders. Section 3 of the act renders more flexible the code section prohibiting the placing of signs on lands or structures in the Canal Zone by authorizing the Governor to regulate that subject matter. Section 4 of the act amends the code section on proceedings on plea of guilty in magistrates' courts so as to make the hearing of testimony discretionary rather than mandatory. Section 5 of the act amends the code section relative to the execution of death sentences so as to shorten the period between time of judgment and date of execution.

By an act approved July 2, 1940, the President was authorized and directed to set aside Barro Colorado Island in Gatun Lake in the Canal Zone, for the purpose of preserving and conserving the natural features of the area, including existing flora and fauna, in as nearly a natural condition as possible, thus providing a place where duly qualified students can make observations and scientific investigations for increase of knowledge, under such conditions and regulations as may be prescribed by a board of directors of the Canal Zone bio-

logical area. The act creates the aforementioned board of directors, prescribes the functions and duties of the board, regulates the handling of funds donated, subscribed, or collected, provides for an executive officer for the board, and authorizes the appropriation of not to exceed \$10,000 for expenses necessary in the administration of the act and for the maintenance of laboratory or other facilities.

By a general act approved June 11, 1940, Public, No. 601—Seventy-sixth Congress, it was made a misdemeanor, punishable by fine of not exceeding \$500 or imprisonment for not exceeding 1 year or both, to stow away on a vessel departing from a port under the jurisdiction of the United States, including the Canal Zone, or, having stowed away in any other place, to remain aboard and be found on the vessel at or before the arrival of the vessel in any such port. The act, further, punishes persons who aid or abet in the offense.

By an act of March 28, 1940, Public, No. 444—Seventy-sixth Congress, a general statute (18 U. S. Code 97) penalizing unlawful entry into military reservations, forts, or arsenals was extended to such reservations in the Canal Zone.

Legislation relating to the Canal Zone, introduced during this fiscal year and still pending in Congress, includes a bill (H. R. 9383; S. 3754) to amend the Canal Zone Code with respect to the trial of joint defendants, the removal of fugitives from justice, and the regulation of criminal procedure in the Canal Zone, and a bill (H. R. 9603) to amend the Canal Zone Code so as to permit the filing of mortgages of personal property, rather than their transcription in books kept for that purpose, and to amend the code provision relative to the taking of vehicles for temporary use or operation so as to vest jurisdiction of first offenses in the magistrates' courts rather than the district court.

Other general legislation considered by the Congress during the year was carefully reviewed and studied for the purpose of determining its effect on the Canal-Railroad organization, and appropriate recommendations were made from time to time when the circumstances indicated such action.

CAPITAL ALLOTMENTS, FISCAL YEAR 1941

The capital allotment appropriation for the fiscal year 1940 of \$2,171,000 was discussed in detail in the annual report for fiscal year 1939. To this appropriation there was added during the year a supplemental appropriation in the amount of \$516,000. Of this amount, \$325,000 was to be used for the construction of Cativa Road, which was obligated by the United States Government through the terms of the new treaty with the Republic of Panama. This road will serve as an outlet for the city of Colon, through territory now under the jurisdiction of the Canal Zone, and in addition to its civil use it will serve as an important element in Canal defense. The

remaining \$191,000 of the 1940 supplemental appropriation is for the expansion of the water supply system. This expansion is necessitated by the increase of Army and Navy activities on the Canal Zone, as well as by the new construction and increased activities of the Panama Canal and Panama Railroad. These increases are making a demand far in excess of the capacity of the present system for supplying water.

The appropriation for 1941 carried \$1,496,000 for the improvements and betterments, and for the replacements of worn out or excessively deteriorated facilities, as follows:

Expansion of water supply system.....	\$500, 000
Beginning of section "A," Balboa high school and junior college.....	350, 000
Quarters for American employees.....	300, 000
Steel sand barge.....	100, 000
Relocate Gaillard Highway at Fort Clayton.....	90, 000
Cement shed at Cristobal.....	86, 000
Improvements to Corozal Hospital.....	47, 000
Expansion and improvement of Gorgas Hospital facilities.....	23, 000
Total.....	1, 496, 000

Expansion of water supply system.—This appropriation is required for the continuation of the expansion of the water supply system begun in 1940, through the supplemental appropriation of \$191,000. As stated above, this expansion is necessary to relieve the overtaxed facilities of the present system which are now running at capacity limits. With the continuance of new construction activity by both Army and Navy, as well as by the Panama Canal, this expansion is an immediate necessity.

Beginning section "A," Balboa high school and junior college.—This project is an immediate need to accommodate the large increase in school population due to the expansion of military posts on the Isthmus, as well as to the additional personnel required by the increased construction activities on the Canal Zone. This will alleviate the crowded and unsatisfactory conditions now existing in the elementary grades, where unsuitable temporary quarters are now in use, by allowing the high school to use jointly with the junior college the new building for all classroom work. This will allow the former high school building to be used for elementary school grades.

Quarters for American employees.—A considerable portion of the existing dwellings for American employees and their families consists of frame structures built prior to 1914 in the early days of American occupation, many of which were transferred from construction camps to their present locations in the permanent town sites. All of these frame quarters held over from construction days have become so deteriorated that they are not only below reasonable standards of family shelter, but the expenditure for repairs which are being made from year to year necessary to keep them habitable, is largely an

economic waste. The old quarters are therefore being replaced by a continuous building program over a period of years.

Barge.—This project calls for the construction of a new steel barge, for the primary purpose of transporting sand, to replace one existing barge now in an advanced stage of deterioration, the older barges having been constructed and in use since 1908.

Relocate Gaillard Highway at Fort Clayton.—This project is to relocate the existing part of the highway now passing through the post of Fort Clayton which is now a main thoroughfare of the post as well as a main highway. The enlargement of this post and the increased use of the road for Army maneuvers and traffic has made this a driving hazard for automobiles, and interferes with regular Army maneuvers. The relocation will bypass the post of Fort Clayton from the new Cardenas River bridge to a point on the existing highway at the foot of Miraflores Hill.

Cement shed at Cristobal.—This building is to replace the existing cement storage shed and other separate structures serving the scrap and reclamation activities of the storehouses. The building now in use dates from the construction period and is in a poor physical condition. It is now inadequate in size to handle the cement stocks necessary to be kept on hand by the Canal.

Improvements to Corozal Hospital.—This project is designed to relieve the unsatisfactory conditions in the asylum caused by the colored and alien patients being quartered in the same building as the white Americans. This project will provide pleasanter surroundings and adequate room, which will be conducive to better treatment and care of the patients. The staff of nurses will necessarily have to be increased to take care of the separation of wards. This calls for the construction of additional quarters to take care of the increased force of nurses.

Expansion and improvement of hospital facilities, Gorgas Hospital.—This project is to cover necessary alterations, and the installation of a passenger elevator in one section of the hospital that heretofore has not been utilized except under emergency conditions. The increase in the Army and Canal Zone personnel makes the alteration and installation of necessary facilities imperative for adequate hospitalization.

In addition to the above allotments for the fiscal year 1941, there has been submitted a supplemental appropriation in the amount of \$3,178,190 for the construction of quarters for American employees.

GENERAL PROGRAM

During each of the past several years the Canal Administration has given considerable study to all phases of Canal activities with a view to developing and carrying forward a well considered building and

construction program, with advance planning extending some 10 years in the future. These studies have been carried out in order that the more pressing needs of the Canal project in the way of replacements, betterments, and enlarged facilities will be provided for under a carefully considered plan.

Previous studies made in this connection were reviewed during the past year, and a detailed 10-year advance construction program has been compiled covering improvements and betterments and also replacements of worn-out, obsolete, or excessively deteriorated facilities, for which funded reserves are insufficient. This program, which covers all anticipated requirements of this nature except for increasing the capacity of the Canal, requires an annual appropriation of about \$2,000,000.

The value of adopting and adhering to a definitely planned program of replacements and betterments lies in the fact that it not only facilitates the submission of comprehensive data regarding future needs to the Bureau of the Budget, but also appreciable savings in the purchase of materials, recruiting and employment of personnel frequently result from coordinating the program for replacements and betterments with the regular activities of the Canal organization.

ADDITIONAL NEEDS

As stated above, lists have been prepared of needed additions and replacements over a period of years and approximate estimates have been made of the costs. Obtaining funds for this work is one of the most important problems of the Panama Canal. During the construction of the Canal inexpensive, temporary, wooden structures were built to house the shops and other parts of the construction plant, the employees, and many of the public-utility and governmental functions, and many of these continued to be used in the interest of economy for housing the operating plant and personnel after construction was completed. Because of the destructive effects of the elements and of the insects in this locality, the economical life of such structures is relatively short. The plan is to replace these with structures of longer life, and at the same time increase their capacity where justified, as funds are obtained. The undertaking is so extensive that many of these old structures are being maintained at excessive cost, and this uneconomical procedure will continue and become progressively worse unless funds can be made available for replacements of many of these structures during the next few years. The most economical method of effecting replacements would be to allocate a definite sum to be used for this purpose each year, as this would permit coordinating the replacement program with the regular activities of the Canal organization.

THIRD LOCKS PROJECT

The third locks project, providing for the construction of an additional set of locks located approximately parallel to, but at some distance from, the existing locks at Gatun, Pedro Miguel, and Miraflores, and for the construction of the necessary bypass channels connecting the new locks with the present Canal channel, together with such appurtenant structures, works, facilities, and enlargements or improvements of existing channels, structures, works and facilities as may be deemed necessary, at a total cost not to exceed \$277,000,000, was authorized by act of Congress (Public, No. 391, 76th Cong.) approved August 11, 1939. This legislation for the construction of additional facilities in the Canal Zone was enacted for the purpose of more adequately providing for the defense of the Panama Canal and for increasing its capacity for the future needs of interoceanic shipping, substantially in accordance with the plans set forth and recommended in the report of the Governor of the Panama Canal dated February 24, 1939, and published as House Document No. 210.

Preliminary planning for the third locks was continued throughout the year by the special engineering division. The work included additional mapping and detailed studies for the exact location of the locks and approach channels. In this connection, geological studies were made by means of auger borings, test pits, rock and soil sampling and testing, and by 40,742 feet of core borings. Cost and quantity estimates were made for locks of various sizes, and at various locations. Electrical studies made were in connection with the power requirements during construction. Masonry design studies were made on various types of lock wall sections. Preliminary studies of hydraulic features were carried out. A program for future hydraulic studies was developed and model studies commenced on manifolds, complete hydraulic systems for the locks, approach channels to the locks, and on surges in the Canal. Location and design studies were made of movable bridges over new locks at Gatun and over existing and new locks at Miraflores and for highway tunnels under the new locks at Gatun and Miraflores. Proposals were received from firms of consulting engineers for engineering services in connection with the design and construction of a movable bridge at Miraflores and designs were prepared for the east approach viaduct to the Miraflores movable bridge. Construction schedules and estimates were prepared to meet anticipated conditions with respect to appropriations of construction funds. Detailed relocation studies were made concerning the effect of new lock construction on existing railroads, roads, municipal utilities, buildings, and other existing facilities. Personnel requirements were studied and plans developed for selection and recruiting of engineering employees.

A special construction division was established in the department of operation and maintenance on September 20, 1939. Duties of this organization include supervision of construction of the third set of locks. Work of the division during the year included preparation of construction schedules and cost estimates, and a comprehensive budget allocating expenditure of \$15,000,000 for the third locks during the fiscal year 1941. Nontechnical parts of specifications for the excavation of the new Gatun locks were drafted and submitted for discussion. Construction camp sites were selected and construction initiated at Cocoli for gold and silver personnel on the Pacific side, and at Gatun for silver personnel and at Margarita for gold personnel on the Atlantic side. Plans, schedules, and cost estimates were prepared for utility and building changes made necessary by the new locks, in order that relocation work thereon could be initiated immediately upon notice of appropriation of funds. In this connection, plans were practically completed for relocating the Army reservation boundary at Fort Davis and for replacement of all Army structures and utilities at Fort Davis affected by construction of the third locks. Tentative negotiations were conducted with qualified keymen for employment in the construction organization and when funds were appropriated June 24, 1940, for construction of the third locks, formal offers of employment were tendered selected men. These new employees did not arrive until after the end of the fiscal year.

The War Department civil appropriation act of the Seventy-sixth Congress, Public, No. 653, approved June 24, 1940, contained an item of \$15,000,000 to initiate work authorized by the act of August 11, 1939, and authorized the Governor, with the approval of the Secretary of War, to make or authorize the making of contracts prior to July 1, 1941, for or on account of the construction of such additional facilities to an amount not to exceed \$99,000,000.

Construction work began on July 1, 1940. At 7 a. m. on that date the dipper dredge *Cascadas* started excavation at the Pacific end of the bypass channel leading to the new Miraflores lock site.

PANAMA CANAL TWENTY-FIFTH ANNIVERSARY

The twenty-fifth anniversary of the opening of the Panama Canal was celebrated on August 15, 1939, in accordance with the joint resolution of Congress adopted March 28, 1939.

A feature of the celebration was the Canal transit of the *S. S. Ancon* of the Panama Line, which reenacted its voyage of 25 years before when, as the first commercial vessel to transit the Canal, the *Ancon* opened the waterway to commercial traffic.

Ceremonies in honor of the occasion were held in all the Canal zone communities and were attended by thousands of residents of the Canal Zone and the Republic of Panama.

SECTION IV

GOVERNMENT

The civil government of the Canal Zone is conducted as prescribed in the Panama Canal Act of August 24, 1912, and subsequent acts and Executive orders made applicable to the Canal Zone. Whenever practicable, governmental functions have been assigned to departments in the organization established for the operation and maintenance of the Canal. Complete cooperation and increased efficiency are derived from such coordination of functions.

Data on the expenses and revenues of various features of the Canal operation and government are shown in the financial and statistical statement in section V of this report.

AREA OF THE CANAL ZONE

The total area of the Canal Zone,¹ with areas segregated for various purposes, is shown herewith, as of June 30, 1940:

	<i>Square miles</i>
Land area of the Canal Zone.....	362. 01
Water area of the Canal Zone (inclusive of Madden Lake to +260-foot contour).....	190. 94
Total area of the Canal Zone.....	552. 95
<hr/>	
Land areas—military and naval reservations (inclusive of revocable-license area):	
Military reservations.....	66. 85
Naval reservations.....	7. 36
Land areas, Canal Zone town sites and areas in active use (exclusive of Army and Navy posts).....	12. 46
Barro Colorado Island.....	5. 71
Forest preserve.....	5. 47
Swamps.....	16. 50
Cattle pastures.....	59. 64
Commercial farms (leases).....	. 57
Usable land.....	187. 45
Total land area as above.....	362. 01

POPULATION

A complete census of the Canal Zone was taken as of April 1, 1940, as part of the sixteenth decennial census of the United States, in accordance with the plans prescribed or approved by the Director of

¹ Not inclusive of noncontiguous areas, with the exception of Patilla Point Military Reservation.

Census in Washington. The total population was 51,827, a gain of 12,358, or 31.3 percent, for the 10-year period 1930-40. Of the above total, 31,502 were in the district of Balboa and 20,325 were in the district of Cristobal.

PUBLIC HEALTH

General health conditions in the Canal Zone and the two terminal cities of Panama and Colon in the Republic of Panama continued satisfactory throughout the year. There were no epidemics of communicable disease.

Due to the increase in personnel of the Panama Canal, United States Army and Navy, and contractors with the Government, the Canal Zone dispensaries and hospitals have been taxed to capacity. All of the wards at Gorgas Hospital have been opened, and an annex to the hospital is now being constructed in the vicinity of Ancon laundry. An addition to Balboa dispensary was built, and other dispensaries were remodeled and additional physicians were employed to take care of the increasing number of patients.

VITAL STATISTICS

The morbidity and mortality rates from disease and injuries, and other vital statistics relating to the populations of the Canal Zone and the cities of Panama and Colon, are set forth in detail in the calendar year report of the health department, which is published annually in booklet form. For this reason, most of the tables are omitted from this report, and the data pertaining to vital statistics are a limited resumé of death rates, birth rates, and infant-mortality rates.

General death rate.—For the Canal Zone in the calendar year 1939 the death rate from all classes was slightly higher than for the preceding year, but has shown little change since 1934, when it dropped below 7 per 1,000 for the first time. The death rate is artificially low because employees generally leave the Isthmus after retirement, and because the population includes a large number of relatively young soldiers. For Panama City the rate has altered very little, averaging 13.01 for the past 5 years. Colon, which has consistently run a slightly higher death rate in the past years, showed a decisive drop in 1939 from the previous years, the rate dropping to 11.57 for 1939. This is the lowest death rate per 1,000 on record for the city of Colon. The death rate in Colon for the past 5 years averaged 13.93 per 1,000. Below are shown death rates by yearly periods for the past 5 years:

Death rates per 1,000 population—all causes

Calendar Year	1939	1938	1937	1936	1935
Canal Zone	6.32	5.79	6.24	5.62	5.89
Panama City	11.93	12.36	13.72	14.41	12.61
Colon	11.57	16.03	14.53	14.60	12.90

Birth rate.—In the Canal Zone the birth rate per 1,000 population is low, as the white population includes a large number of enlisted men in the Army, and the colored population includes a high proportion of employees in the older age group, as only colored employees with more than the average length of service are able to secure assignment to quarters in the Canal Zone. The following table shows the birth rates in the Canal Zone and in the terminal cities of Panama and Colon for the past 5 calendar years:

Live birth rate per 1,000 population

Calendar Year	1939	1938	1937	1936	1935
Canal Zone:					
White	7.51	7.96	7.18	6.25	7.52
Colored	14.90	14.48	15.88	16.03	15.10
Combined	10.76	10.91	11.20	10.91	11.35
Panama City	28.34	31.64	33.73	35.46	30.69
Colon	25.02	30.46	31.85	31.50	29.63

Death rates among children under 1 year of age.—The following table shows the infant mortality rates per 1,000 live births for the past 5 years:

Deaths of infants under 1 year of age per 1,000 live births

Calendar Year	1939	1938	1937	1936	1935
Canal Zone:					
White	31	5	12	35	32
Colored	87	58	97	63	59
Combined	65	37	68	54	50
Panama City	91	78	95	93	90
Colon	77	99	77	89	76

Principal causes of death.—The eight principal causes of death in each of the three groups of the population were as follows:

Number of deaths and annual rate per 1,000 population, calendar year 1939

Cause of death	Canal Zone		Panama City		Colon	
	Number	Rate per 1,000	Number	Rate per 1,000	Number	Rate per 1,000
Organic diseases of the heart	40	0.88	104	1.04	61	1.40
Diseases of the arteries	26	.57	52	.52	22	.50
Cancer of various organs	16	.35	65	.65	34	.77
Apoplexy	16	.35	42	.42	21	.48
Tuberculosis	13	.29	217	2.17	66	1.50
Pneumonia	11	.24	138	1.38	38	.86
Nephritis (acute and chronic)	11	.24	72	.72	41	.93
Diarrhea and enteritis	6	.14	76	.76	24	.55

MALARIA

The malarial rate among the employees of the Panama Canal and the Panama Railroad Co. showed a slight increase over the record

low of 10.4 per thousand set in 1938, with a rate of 14.0 per thousand for the calendar year 1939. While the cycles of rise and fall in the malarial rate do not appear to follow each other within fixed and predictable spans of years, it does seem that there are factors, other than those instituted by man, the nature and extent of which we do not know, that markedly influence the rates from year to year, or over longer periods. No employee has died of malaria within the past 7 years, and but 6 employees have died of malaria in the past 19 years.

The rates for malaria, among employees only, for the past 10 years are shown below:

Calendar year	Rate	Calendar year	Rate
1930.....	26	1935.....	15
1931.....	19	1936.....	12
1932.....	14	1937.....	12
1933.....	27	1938.....	10
1934.....	16	1939.....	14

HOSPITALS

The number of patient-days in Panama Canal hospitals for the past 3 fiscal years has been as follows:

	1940	1939	1938
Gorgas Hospital.....	211, 113	162, 172	170, 811
Corozal Hospital:			
Insane.....	78, 139	72, 169	67, 388
Cripples and chronic medical and surgical cases.....	35, 581	38, 059	41, 937
Colon Hospital.....	33, 543	30, 508	30, 784
Palo Seco leper colony.....	45, 477	43, 124	39, 723
Total.....	403, 853	346, 032	350, 643

QUARANTINE AND IMMIGRATION

Inspection was made of 6,292 vessels and 729 airplanes, as compared with 6,727 vessels and 761 airplanes during the preceding year; 149 vessels availed themselves of the "special demand" night boarding service, as compared with 65 last year.

The decrease in shipping, shown by these figures, is thoroughly discussed in section I of this report. The general disturbance in world conditions had led to the belief that there might be an increase in the number of cases of illness brought in by transportation agencies. However, no variation in this respect was noted from previous years and no case of quarantinable disease was encountered.

Yellow fever continued to be endemic in parts of Africa and South America, where it was reported mainly as the jungle type. Due to its proximity in South America, this disease remained a menace, and

accordingly careful inspection of all persons arriving by aircraft was practiced throughout the year. A few persons with symptoms of yellow fever were admitted to quarantine and were immediately isolated, but their illnesses proved to be other than yellow fever. Plague continued to be reported from various parts of the world, and, as was the case with yellow fever, cases reported from South America were of particular concern to the Canal. Fumigation of ships and cargoes was continued in accordance with the requirements of the regulations. Cholera was reported mainly from China and India, where, at times, it existed in epidemic form. While a considerable number of ships which had called at ports infected with the disease visited the Canal, distance and the short incubation period were important factors of safety. No case occurred on any vessel visiting the Canal.

Typhus fever was most prevalent in parts of Africa and in south-eastern Europe. Many cases also were reported from Chile.

Smallpox, mainly in endemic form and of mild type, existed in many parts of the world. The presence of the disease in nearby countries of South America requires constant watchfulness and precaution to prevent its introduction into the Canal Zone.

Immigration activities, in addition to regular and routine procedures, continued to be actively concerned with the problem of refugees from Europe. Activity at the quarantine station was four times as great as in either of the 2 preceding years, the number of detention days for fiscal year 1940 being 35,670 as compared to around 9,000 a year in 1938 and 1939.

The following is a summary of transactions for the year:

	Fiscal year 1940	Fiscal year 1939	Fiscal year 1938
Vessels inspected and passed	6,292	6,727	6,486
Vessels granted pratique by radio	129	321	122
Total	6,421	7,048	6,608
Crew passed at quarantine	319,217	369,628	368,955
Crew passed by radio	25,460	126,539	29,751
Passengers passed at quarantine	109,847	130,731	148,056
Passengers passed by radio	1,949	3,018	5,817
Total	456,473	629,916	552,579
Airplanes inspected and passed	729	761	614
Crew of airplanes inspected and passed	3,090	3,279	2,752
Passengers of airplanes inspected and passed	6,517	4,643	1,022
Total	9,607	7,922	6,774
Vessels detained in quarantine	0	0	0
Crew detained on board ship for quarantine			
Immigration cases admitted to station	1,281	1,015	1,183
Number of detention days	35,670	9,039	9,153
Persons held for investigation and released	176	610	325
Persons deported under immigration laws	1,861	1,339	1,017
Supplementary inspection of vessels	4,053	3,827	3,674
Vessels fumigated	46	41	64
Boxes fumigated	148	266	255
Number of "special demand" night boardings	149	65	106

MUNICIPAL ENGINEERING

Municipal work carried on during the year included the construction and maintenance of roads, streets, and sidewalks, and the maintenance and operation of water and sewer systems, and miscellaneous construction jobs of various kinds.

TESTING LABORATORY

A well-equipped laboratory was maintained for the making of chemical and bacteriological analyses of water, chemical analyses of different materials, concrete tests, tests for selection of suitable aggregates for concrete, tests to determine the suitability of different materials and supplies for Canal uses, tests to determine the presence or absence of deleterious gases in the holds of ships and oil tanks, soil and permeability tests, etc.

During the year the testing laboratory carried on a variety of work, making a total of 5,849 tests in connection with 2,989 varied samples. This included 1,779 tests on water and 916 tests on concrete for various purposes. Other tests were made on building materials, clay and soil, gas and oils, and various metals, etc., while inspections were made of swimming pools, ships, tanks, etc.

WATER SYSTEM

Consumption of water for municipal uses during the past 3 fiscal years has been as follows:

	1940	1939	1938
	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Canal Zone.....	3,468,961,223	3,179,439,500	3,159,332,000
City of Panama.....	1,899,779,000	1,761,706,000	1,568,202,000
City of Colon.....	892,972,000	811,639,000	807,194,000
Sales to vessels.....	175,681,627	177,628,840	184,781,000
Total.....	6,437,393,850	5,933,433,340	6,079,509,000

The following statement shows the quantity of water pumped at each of the pumping stations during the year, the average per month, and the cost of pumping per thousand gallons:

Pumping station	Total gallons pumped during year	Average gallons per month	Average cost per 1,000 gallons for pumping
Gamboa (intake).....	4,144,489,000	345,374,000	\$0.0081
Miraflores (relay).....	731,713,000	60,976,000	.0191
Balboa (relay).....	2,983,890,000	248,658,000	.0062
Paraiso (relay).....	109,879,000	9,157,000	.0432
Miraflores Lake (intake).....	4,908,000		.0231
Mount Hope (intake).....	1,942,281,000	162,523,400	.0199
Agua Clara (intake).....	438,528,600	36,603,000	.0656
Monte Lirio (intake).....	477,000	39,750	.5754
Frijoles (intake).....	5,491,850	457,700	.2596
Total.....	10,361,656,850	863,788,850	

Of the above stations those at Paraiso, Miraflores, and Balboa are relay stations. Omitting the water which was repumped from the total listed above, 6,536,174,850 gallons of raw water, an average of more than 17,800,000 gallons a day were pumped by the municipal water system during the past year. All pumps are electrically driven, except those at Frijoles and Monte Lirio, which are driven by gasoline engines.

The usual maintenance work was performed on the pipe lines, reservoirs, filtration plants, and pumping stations during the year. In addition to regular maintenance, work was performed on a number of special projects.

SEWER SYSTEM

In addition to the regular maintenance work performed on the sewer system, the following special work was accomplished: Construction of new sewers at old townsite of Paraiso, now occupied as an Army camp, for taking care of sewerage disposal at Paraiso as well as part of the disposal from the town of Pedro Miguel; the separation of storm and sanitary sewers at end of Canal Street, Cristobal; extension of main sewers serving Colon and New Cristobal, by extending the disposal pipe approximately 1,000 feet into deep water; installation of additional storm sewer, Roosevelt Avenue, Balboa, to remedy flooding; and storm drainage at Mount Hope.

ROADS, STREETS, AND SIDEWALKS

In addition to maintenance work performed on roads, streets, and sidewalks in the Canal Zone, many special projects were carried out during the year. These included: Completion of reconstruction of the Cardenas River bridge; widening steets and constructing parking spaces, Pedro Miguel; removal of trees along Barnaby Street, Balboa, preparatory for widening; construction of new road from Calidonia Crossing in Panama to connect with Tivoli Road and Gaillard Highway near San Miguel Crossing; construction of "off the road" stopping places for loading and unloading of bus traffic; construction of new road leading from Miraflores Hill to Miraflores Lake to take care of traffic using new ferry slips; construction of sidewalks in Ancon and Balboa, parking spaces at Balboa stadium, commissary and dispensary; widen Roosevelt Avenue from mechanical division main gate to La Boca; improvements, replacements, and reconstruction of different sections of Bolivar Highway.

TOWNSITE DEVELOPMENT

Due to the increase in Canal Zone population, several areas were developed by the municipal engineering division in preparation for erection of houses. Areas were graded, roads and walks constructed

and water and sewer lines installed. The following principal areas and sites were developed: Diablo Heights, location of new construction town and headquarters for new construction division; Ancón areas formerly used by the municipal division and motor transportation division; Williamson Place, new residential area in Balboa for housing of new employees; development of Pedro Miguel area for housing new construction personnel; and the preparatory work on the Margarita and Cocoli gold townsites for proposed third locks construction.

CITIES OF COLON AND PANAMA

Regular maintenance work was performed on the water and sewer systems and the streets during the year. There were no major improvements or special projects carried out for the city of Panama. In Colon, the disastrous fire of April 13, 1940, which destroyed a large part of the city, constituted the main project. After the fire the municipal division of the Panama Canal cleared over 13,500 cubic yards of debris from the streets and sidewalks. The Panama Canal took over the task of demolishing and removing the remaining 46 partially burned concrete buildings. Approximately 320 feet of sanitary sewer lines were constructed for emergency public sanitation; the extension of Front Street and the cleaning of storm sewers in Colon were other special projects carried out during the year.

MISCELLANEOUS PROJECTS

Sosa Hill quarry and rock crushing plant.—The new rock crusher purchased in the previous fiscal year, and made necessary by the increased demand for rock in new construction work, was installed and started operation on June 15, 1940. Though the output was slightly decreased due to the revamping of the old plant and installation of new machinery, during the past fiscal year 66,451 cubic yards of rock were crushed and sold to various departments and divisions of the Panama Canal and the Panama Railroad Co., the Army and Navy, and other outside interests.

Cocoli rock crushing plant.—A small auxiliary rock crushing plant was erected in an old abandoned quarry on the west side of the Canal, the output of this quarry being used for construction of roads in the new town site of Cocoli.

Colon corridor.—The construction of a road running from Colon to the Canal Zone boundary, on a strip of land ceded by the United States Government to the Republic of Panama, was begun with necessary fills, culverts, and clearing. Work is now suspended waiting the coming dry season for completing the laying of concrete slab.

Playground site.—The area between the Balboa Heights railroad station, Gaillard Highway, and the Panama Railroad roundhouse was

filled during the past dry season. This is to be used for a new playground, made necessary by the increased building activity of the Canal and the utilization of the present playground site for the new Junior College building now being constructed.

PUBLIC ORDER

During the past fiscal year 3,977 persons were placed under arrest by the Canal Zone police, an increase of 918 arrests, or 30 percent, as compared with the previous year, when 3,059 arrests had been made. Statistics covering these arrests, with corresponding arrests for the previous year, are covered in the following table:

	1940	1939
	<i>Persons</i>	<i>Persons</i>
Male	3,776	2,888
Female	201	171
Total	3,977	3,059
Arrests made with warrants	301	243
Arrests made without warrants	3,676	2,816
Total	3,977	3,059
Residents of Canal Zone	1,155	916
Residents of Panama	2,316	1,841
Transients	506	302
Total	3,977	3,059

There were 4,324 charges filed against persons arrested during the fiscal year, of which 4,216 were misdemeanors and 108 were felonies, the latter being 2.5 percent of the total offenses charged. Following were the principal causes of arrests:

Cause of arrest	1940	1939	Cause of arrest	1940	1939
Violation of vehicle traffic regulations	2,179	1,557	Petit larceny	162	124
Violation of immigration regulations	422	240	Fugitive from justice	149	114
Loitering	229	321	Disorderly conduct	143	112
Disturbing the peace	186	139	Vagrancy	65	117
Battery	185	128	All others	604	463
			Total	4,324	3,315

The persons arrested included nationals from 68 countries and territories and were of 147 different trades and professions. Nine cases of homicide were investigated by the coroner during the year. Of the seven cases in which "involuntary manslaughter" was the charge, four were dismissed, a verdict of "not guilty" was returned in one, a conviction carrying a sentence of 6 months in Balboa Jail made in another, and one case was still pending in the Cristobal District Court at the end of the year. One charge of "voluntary manslaughter" resulted in conviction and sentence to 1 year at hard labor in the Canal Zone

Penitentiary. One defendant, arrested on a charge of "murder" and on two charges of "assault with intent to commit murder," was transferred to the Corozal Hospital for mental observation and was later adjudged insane in the Balboa District Court.

During the year the coroner investigated five cases of "suicide" as compared with nine in the preceding year. Of these suicides, one was by drowning, two by hanging, one by cutting his throat, and one by poison. Coroner's investigations were made in 66 cases of death during the year. Fifteen of these deaths were due to automobile accident injuries, 23 to natural causes, and 10 to accidental drowning.

A daily average of 57 prisoners served sentences in the common jails of the Canal Zone during the year, and all of those physically able were employed on maintenance of trails, road repairs, and other municipal improvements; others were employed on janitor and miscellaneous work at police and fire stations and at target ranges. The total value of such common-jail labor for the year was \$19,783.26.

Thirty-seven convicts were committed to the Canal Zone Penitentiary during the year, a decrease of 6 from the preceding year, with aggregate sentences of 56 years and 6 months. Forty-one convicts were discharged. At the close of the year 67 convicts remained in custody, as compared with 71 at the end of the preceding fiscal year. The convicts were employed during the year on road and municipal improvement work; improving and clearing penitentiary grounds; maintaining of prison buildings; manufacturing and repairing prison clothing; and the cultivation of fruits and vegetables, etc., at the penitentiary farm. Labor performed by convicts was valued at \$29,605.80. The total value of fruits, vegetables, and other products of the penitentiary farm amounted to \$6,662.87, as compared with \$6,543.71 the previous year.

Forty-four persons were deported from the Canal Zone by the Governor during the year. Of this number 27 were convicts who had served sentences in the penitentiary and 17 were persons who had been convicted of misdemeanor charges or who were otherwise deemed undesirable persons to be permitted to remain in the Canal Zone.

The increase in the registration of motor vehicles which exceeded those licensed in any previous year was reflected in the increased number of traffic accidents that occurred in the Canal Zone during the fiscal year. There was a total of 568 accidents, or an average of 47.33 per month, as compared with 441 traffic accidents, or an average of 36.75 per month during the previous fiscal year. These accidents resulted in the deaths of 11 persons and injuries to 182 persons, of whom 47 were pedestrians.

Following is a classification of the causes of these accidents for the past 2 years.

Cause	1940	1939	Cause	1940	1939
Reckless driving	257	210	Defective vehicles	21	15
Negligent driving	205	149	All other	18	14
Careless pedestrians	29	23			
Inexperienced driver	24	16	Total	568	441
Intoxicated driver	14	14			

The harbors of Balboa and Cristobal, the Chagres River and the Canal in the vicinity of Gamboa, Gatun Lake, and the Madden Dam Lake area were patrolled throughout the year, principally for the enforcement of the navigation laws and regulations. During this period motor launch patrol officers arrested a total of 17 persons for violations of the navigation regulations. During the course of the year police officers on monthly patrols of the interior or rural sections of the Canal Zone made 22 arrests, of which 11 were on charges of trespassing, 1 of malicious mischief, 3 of petit larceny, 1 of embezzlement, 2 of disturbing the peace by fighting, 3 of committing a public nuisance, and 1 of moving a boundary line monument.

Detectives effected 256 arrests, and in addition made 671 investigations during the year. The usual routine work was carried on by the criminal identification bureau in cooperation with the Army and Navy and with other law-enforcement organizations and immigration authorities.

At the Canal Zone Penitentiary a wooden structure with concrete base, used as quarters for bachelor officers stationed thereat, was razed by convict labor and a new structure was built on the same foundation by the constructing quartermaster. During the dry season the stockade fence was replaced and extended; the old woven and barbed-wire material was removed and replaced by an 11-foot cyclone fence; the extension permits addition of cell space and a drying room to the main stockade building.

FIRE PROTECTION

During the year 141 fires, 16 false alarms, and 2 emergency calls were reported. The following table lists the owners on whose property these fires occurred and the extent of losses suffered, together with a comparison with the fires occurring in the previous year:

	1940		1939	
	Number of fires	Property loss	Number of fires	Property loss
Panama Canal	95	\$2,804	61	\$4,625
Panama Railroad Co	12	288	4	4
United States Army	4	42	3	300
United States Navy	1		1	600
Private	29	212,453	23	1,907
Total	141	215,587	92	7,336
Total value of property involved		\$2,174,256		\$818,879

The principal loss from fire recorded in the Canal Zone during the past fiscal year resulted from a fire discovered at sea in the cargo space of the S. S. *Wind Rush*. This fire was discovered at 3:45 p. m. on December 21, 1939, and the vessel then proceeded full speed to Cristobal. It arrived at 6:30 p. m. on December 22, was immediately taken under control by the fire section of the Panama Canal, and the fire was extinguished by 12:30 a. m. the following morning. The damage to the vessel and cargo is roughly estimated at \$210,000, this loss being included in the above table under "Private" property.

COLON FIRE

A serious fire broke out in Colon at about 6 p. m. on April 13, 1940, and request was made of United States Government agencies for aid. Panama Canal firefighting apparatus and personnel were sent immediately and joined the Colon forces and those of the United States Army and Navy in fighting the fire. The Panama Canal tugs *Tavernilla* and *Favorite* also were used for pumping water to hose lines.

The Panama Railroad provided a special train, made up of flat cars and passenger coaches, for transporting fire engines and firemen from Panama City to Colon.

When the flames continued to spread, it was decided to dynamite a number of buildings. Expert powdermen of the municipal engineering division supervised this work.

The fire was under control shortly after midnight. A total of 270 buildings were destroyed or so badly damaged as to require rebuilding. Approximately 10,000 persons were homeless. The United States Army furnished tents for sheltering many of these persons and welfare organizations provided food.

At the request of the Panamanian Government, the municipal engineering division cleared the debris from the burned area. The work of rebuilding is progressing slowly.

MAGISTRATES' COURTS

BALBOA

In the magistrate's court for the subdivision of Balboa, 10 civil and 2,372 criminal cases were disposed of, whereas a total of 1,877 were disposed of during the previous year. In the criminal cases 2,042 resulted in conviction, 201 in acquittal, 56 were dismissed and 73 were held for the district court. Imposition or execution of sentence was suspended in 197 cases and the defendants were placed on probation. Of this group 14 were rearrested for violating the terms of probation and were returned to serve the sentence originally imposed. The increase in cases handled is attributed to the increase in personnel of the Panama Canal and the Army and Navy organi-

zations during this year. Total revenues collected amounted to \$9,576.50.

CRISTOBAL

In the magistrate's court for the subdivision of Cristobal, 8 civil and 1,303 criminal cases were disposed of, whereas 1,056 cases were disposed of in the previous year. In the criminal cases 1,177 resulted in conviction, 48 in acquittal, 27 were dismissed, and 51 were held to the district court. Imposition or execution of sentence was suspended in 53 cases and the defendants were placed on probation. Of this group 2 were rearrested for violating the terms of probation and were returned to serve the sentence originally imposed. The increase over the previous year in cases handled, amounting to approximately 30 percent, is attributed to the increase in personnel of the Panama Canal and the Army and Navy organizations during this year. Total revenues collected amounted to \$6,060.60.

PARDONS AND REPRIEVES

The pardon board, consisting of 5 members, is appointed by the Governor and acts in an advisory capacity. On March 29, 1940, Mr. Paul A. Bentz was appointed a member of the board in succession to Mr. F. H. Wang who was relieved of that duty following his appointment as executive secretary. No other change in the personnel of the board was made. During the year 33 applications for executive clemency were considered by the pardon board. On the board's recommendation, the Governor extended clemency in nine of these cases. At the end of the year 2 applications were still under consideration by the board.

PUBLIC SCHOOL SYSTEM

Except for the fact that the Canal Zone schools are situated in the various towns rather than in sections of a city, the school organization is comparable with the usual city school system in the United States, having a superintendent with assistants in general charge and a principal for each school.

It has been the practice for a number of years to make comparison of enrollment from one year to the next on the basis of the number attending school at the end of February, as February is usually a peak month. The total number of regular pupils enrolled in February of the past fiscal year in both white and colored schools, was 6,353, which is an increase of 225 or 3.7 percent since February 1939. In the white schools the regular enrollment increased from 3,103 to 3,453, an increase of 350 or 11.3 percent over the preceding year. In the colored schools, enrollment dropped from 3,025 to 2,900, a decrease of 125, or 4.1 percent. Free school privileges are granted to children of silver employees of the Panama Canal and the Panama Railroad

Co. only when such employees reside on the Canal Zone. Colored school enrollment has shown a steady decline since 1932, the peak year, when the number enrolled in February was 4,149.

For the past 5 years the average daily attendance has been as follows:

	1940	1939	1938	1937	1936
White schools.....	2,798	2,686	2,765	2,755	2,717
Colored schools.....	2,686	2,818	2,881	3,091	3,186
Total.....	5,484	5,504	5,646	5,846	5,903

The above does not include the enrollment in the Canal Zone junior college.

The anticipated increases in school enrollment by reason of the proposed third locks construction, Army expansion, and Canal Zone construction has led to a detailed study by the division of schools of the additional facilities that will be required. This study covers the period of increasing enrollment beginning in September 1940 and continuing through 1942. It contemplates an increase in white schools alone, as no plans are now being considered for housing of additional colored families in the Canal Zone. In order to meet these increases, new school buildings are to be constructed at Diablo Heights, Margarita, Cocoli, and Fort Kobbe. The school at Diablo Heights, for grades from 1 to 6, is to accommodate an estimated enrollment of 211 in September 1940 with a maximum of 435 to be reached in 1943. As a result of the Army expansion at Fort Kobbe and Howard Field, approximately 200 students in grades from 1 to 6 will be accommodated in a new building to be constructed by the United States Army. In Margarita a 15-classroom school building is to be constructed with an estimated enrollment of about 118 at the beginning of school year in September 1941, with a maximum of 295 to be enrolled by September 1942. At Cocoli the program calls for the accommodation of 224 children in grades 1 to 8 rather than grades 1 to 6 as in the other schools. The enrollment of grades 7 to 12 will be accommodated by the Balboa and Cristobal junior and senior high schools. The Balboa enrollment will probably double during the next 4 years with a total enrollment of approximately 1,270 pupils in September 1942. This increase will be taken care of through the completion of section "A" of the Balboa High School-Junior College group now under construction. Cristobal High School facilities are adequate to take care of the expected increase in junior and senior high-school enrollment.

POSTAL SYSTEM

Eighteen post offices were in operation by the Canal Zone postal system at the end of the year. These included eight post offices in civilian towns of the Canal Zone, eight at the United States Army

posts, and two at United States naval stations. During the year, four additional post offices were established or reestablished: a post office was reestablished at Camp Paraiso on November 8, 1939; on December 1, 1939, post offices were established on the Army post of Albroom Field and on the naval station at Upham; on June 1, 1940, a post office was established in the newly created civilian town of Diablo Heights.

Net receipts for the postal system were \$15,339 for the fiscal year 1940. Operations for the past year are summarized and compared with the preceding fiscal year in the following table:

	1940	1939
Sale of postage stamps, postal cards, stamp books, etc	\$436,154	\$289,638
Money-order fees	24,944	20,757
Box rents collected	22,018	18,982
All other receipts	18,338	19,582
Total receipts	501,454	348,959
Total expenses	486,115	330,000
Net surplus	15,339	18,959

On July 15, 1939, a series of six air-mail stamps was released for sale to commemorate jointly the tenth anniversary of air-mail service to and from the Canal Zone and the twenty-fifth anniversary of the opening of the Canal to commercial operations in 1914. These were followed by 16 stamps of a regular series released August 15, 1939, commemorating the twenty-fifth anniversary of the date on which the Canal was opened to world commerce. The subjects for the regular stamps were scenes before and after construction of the Canal, the locks, Gaillard Cut, and Balboa, in conformity with the expressed wish of President Roosevelt. Favorable comments were received from many sources regarding both issues and their popularity was confirmed by the first day sales which amounted to \$34,973.18.

On April 15, 1940, a 30-cent stamp bearing the likeness of the late Col. Sydney Bacon Williamson was placed in use, in commemoration of his service as division engineer of the Pacific division during the construction period from 1907 to 1912. The 30-cent stamp represents an addition to the permanent series of stamps dedicated to the memory of the members of the Isthmian Canal Commission as established on the Isthmus during 1907. The first-day sales of the Williamson stamp amounted to \$3,004.20.

The interest rate of 2 percent per annum on deposit money orders remained unchanged during the year. Statistics covering the operation of the deposit and regular money orders are given in the following table:

	1940	1939
Deposit money orders:		
Money orders issued.....number..	24, 187	21, 422
Money orders issued.....value..	\$2, 017, 380	\$2, 130, 325
Money orders paid.....number..	22, 511	23, 222
Money orders paid.....value..	\$1, 849, 300	\$1, 861, 730
Funds on hand at end of year.....value..	\$2, 238, 270	\$2, 070, 190
Regular money orders:		
Money orders issued.....number..	233, 764	196, 012
Money orders issued.....value..	\$4, 244, 052	\$3, 507, 252
Fees collected.....	\$24, 944	\$20, 757
Money orders paid.....number..	49, 746	37, 927
Money orders paid.....value..	\$700, 966	\$589, 011

Other statistics relative to the operation of the Canal Zone postal system are presented in the following table:

	1940	1939
Registered and insured articles dispatched:		
Official letters and parcels registered free.....	47, 474	44, 853
Foreign registered letters.....	28, 504	27, 585
Foreign registered parcels.....	2, 991	2, 975
Domestic registered letters.....	30, 498	18, 636
Domestic registered parcels.....	43	37
Insured and c. o. d. parcels.....	8, 105	5, 797
Total registered and insured articles dispatched.....	117, 615	99, 883
Registered and insured articles received:		
Registered articles.....	82, 485	77, 079
Insured and c. o. d. parcels.....	44, 964	35, 633
Foreign parcel post.....	3, 998	6, 124
Total registered and insured articles received.....	131, 447	118, 836
Dispatches of mail by steamer—Cristobal:		
Dispatches made to the United States.....	456	349
Dispatches made to foreign countries.....	1, 327	1, 466
Total dispatches made by steamer.....	1, 783	1, 815
Dispatches received from United States.....	656	657
Dispatches received from foreign countries.....	1, 654	2, 298
Total dispatches received by steamer.....	2, 310	2, 955
Dispatches of mail by steamer—Balboa:		
Total dispatches made.....	1, 844	2, 161
Total dispatches received.....	2, 281	2, 437

AIR MAIL

Postage rates on air mail matter remained unchanged during the year. Sales of air mail stamps amounted to \$209,843 as compared with \$136,041 during the previous fiscal year, an increase of \$73,802 or approximately 54 percent. This gain in receipts covers an estimated increase of 50 percent in the volume of air mail handled during the year as shown by expenses for transportation. A considerable proportion of the air-mail receipts during the past year represented philatelic sales of new air-mail stamps from the commemorative issue discussed above, and hence the 54-percent increase in receipts is not entirely caused by the normal growth of air-mail activity.

Air-mail schedules were revised during the year, which resulted in 10-hour service between Cristobal and Miami, Fla., three times a week instead of twice weekly as heretofore, while the service between Cristo-

bal and Brownsville was increased to five trips per week. Transit air mail from countries served by United States foreign air mail routes operating in and out of Cristobal doubled in volume owing to the suspension of German and French air lines from operations across the south Atlantic Ocean from Brazil via Africa to Europe.

The Canal Zone continued to pay transportation charges on air mail on the basis of the gold franc which further reduced the margin above transportation charges available to cover the clerical and other expenses involved. Since December 1, 1937, the Canal Zone has been required to make payments for air-mail transportation to the United States Post Office Department on the basis of the gold franc, or about 3.2 francs to the United States dollar instead of about 5.1 francs under normal exchange regulations. As a consequence, about 90 percent of the volume of air mail costs approximately \$5.92 per pound for transportation against \$4.80 revenue received for each full pound. An average of 50 letters per pound for private and general correspondence must be maintained to balance the loss sustained covering business documents and articles weighing in excess of 1 ounce. The difference between sales of air-mail stamps and transportation charges during the year amounted to \$22,958.83, or a return of approximately 12.2 percent for operating expenses. As a considerable proportion of the past year's receipts represented philatelic sales of new air-mail stamps which will not be recurrent items, there may be a downward revision in the ratio available for operating expenses during the coming years.

The number of air-mail dispatches from Cristobal during the year was 6,655 and the number received 13,773 as compared with 6,314 forwarded and 12,459 received during the previous year. Dispatches were made to 62 exchange offices and received from 70 as compared with 60 and 76 respectively during 1939.

IMMIGRATION VISAS

During the fiscal year 53 visas were issued by the executive secretary to alien residents of the Canal Zone traveling to the United States. Of these, 13 were quota visas, 19 were nonquota visas, 19 were non-immigrant visas, and 2 were transit certificates. Fees collected for visas amounted to \$340.50.

RELATIONS WITH PANAMA

Ratification of treaty.—The new treaty between the United States and the Republic of Panama which was concluded March 2, 1936, and ratified by the Republic of Panama the same year, was ratified by the United States and proclaimed on July 27, 1939. This new treaty abrogates several of the provisions of the 1903 treaty and makes various amendments and additions. Among other things, it increases

the annual payment of \$250,000, which the United States was obligated to pay under the 1903 treaty, to 430,000 balboas; defines the classes of persons entitled to reside within the Canal Zone and establishes restrictions on purchases of goods imported into the Canal Zone or produced or manufactured therein by the United States Government, and provides for cooperation by the United States in the construction of the Trans-Isthmian Highway.

Restrictions on the use of the facilities of Canal Zone clubhouses and hospitals which had been in effect for a number of years were included in a note accessory to the new treaty.

Provision was also made in notes accessory to the treaty for the appointment by the two governments of representatives for mutual conference and helpful exchange of views on questions pertaining to smuggling from the Canal Zone into the Republic of Panama, sales to vessels, and water works and sewers in Panama and Colon. Such representatives were duly appointed by the Panama Canal and the Panamanian Government and had frequent conferences.

Miscellaneous.—During the year, correspondence was conducted between the government of the Canal Zone and the Republic of Panama with reference to various matters of joint local interest. This correspondence was generally of a routine nature, dealing with matters relating to customs duties, immigration, municipal improvements, public health, postal service, and repatriation of aliens.

CUSTOMS

The various activities of the Bureau of Customs were continued along the lines outlined in previous annual reports. The following is a statistical summary of the principal items, with the figures for the preceding year shown for comparison:

Item	Fiscal year 1940	Fiscal year 1939
Vessels entered.....	12,090	13,556
Vessels cleared.....	12,084	13,547
Aircraft entered.....	1,421	1,409
Aircraft cleared.....	1,419	1,413
Vessels of United States registry entered.....	4,453	3,985
Vessels of United States registry cleared.....	4,456	3,978
Customs releases on shipments consigned to Panama.....	13,163	12,804
Free-entry releases for shipments to employees of U. S. Government.....	10,149	6,533
Arrests for violation of Narcotic Drugs Import and Export Act.....	0	0
Arrests for violation of customs regulations.....	24	28
Shipments of household goods of employees to United States, inspected and sealed for shipment to United States.....	85	95
Pieces of freight included in above.....	683	651
Invoicees certified for shipment to United States.....	833	937
Special customs inspection out of regular hours:		
Cristobal.....	847	743
Balboa.....	483	513
Total.....	1,330	1,256
Chinese passengers arriving.....	352	556
Chinese admitted to Panama.....	101	303
Vessels with Chinese crews checked.....	394	573

SHIPPING COMMISSIONER

The shipping commissioner and his deputies have the same authority as shipping commissioners in the United States ports and United States consuls in foreign ports with respect to United States seamen. During the fiscal year 1,532 seamen were shipped in vessels of the United States and 1,133 were discharged. No sick or destitute seamen were returned to the United States at the expense of the appropriation for relief of destitute American seamen, but 115 were signed on vessels as workaways, and returned to the United States without expense to the Government.

The total wages earned by seamen who were discharged at Canal Zone ports amounted to \$89,547, and the total approved deductions on account of advances, allotments, fines, slop-chest account, etc., amounted to \$25,916. The balance of \$63,631 was either paid to seamen under supervision of the deputy shipping commissioners or received on deposit for the seamen by the deputy shipping commissioners. The wages, moneys, and effects of five American seamen, two of whom died in Canal Zone hospitals, were handled by the shipping commissioner, and remitted to the proper courts in the United States for disposition.

ADMINISTRATION OF ESTATES

When provision for administration is not otherwise made by the deceased, or requested by the legal heirs, the public administrator takes charge of all estates within the Canal Zone which require administration. In the case of estates with total assets exceeding \$1,000 value, the public administrator charges the regular commissions fixed by law, which are paid into the Treasury of the United States. Commissions amounting to \$961 were collected during the fiscal year. The estates of 164 deceased or insane persons, with cash assets of \$35,664, were settled during the fiscal year.

LICENSES AND TAXES

Licenses issued for motor vehicles, permits for peddling foodstuffs, sales of merchandise generally, ships' runners, and similar purposes numbered 16,225 for the year, and 4,568 motor-vehicle licenses were transferred during the year.

The number of motor-vehicle licenses and transfers and miscellaneous licenses issued during each of the past 10 years and the aggregate fees collected therefor are summarized below. These include licenses for official vehicles for which no charge is made.

Fiscal year	Motor vehicle	Motor-vehicle transfers	Miscellaneous	Total	Fees
1931.....	8,123	2,083	1,443	11,654	\$51,295
1932.....	8,577	1,906	1,312	11,795	52,143
1933.....	8,432	2,270	1,155	11,857	50,039
1934.....	8,389	2,311	1,392	12,092	52,796
1935.....	10,397	2,685	1,122	14,204	56,110
1936.....	10,268	3,276	1,258	14,802	61,482
1937.....	11,467	3,623	1,077	16,167	63,967
1938.....	11,885	3,871	1,146	16,902	66,574
1939.....	12,097	3,859	1,137	17,093	67,636
1940.....	15,167	4,568	1,058	20,793	77,574

FOREIGN CORPORATIONS

Foreign corporations doing business in the Canal Zone are required to secure licenses, and during the year 97 such corporations, the majority of which are steamship lines and steamship agencies, were licensed. Fees amounting to \$970 were collected. Taxes paid by corporations amounted to \$110.

INSURANCE

The license fee for insurance companies doing business in the Canal Zone is \$10 per year. At the end of the past fiscal year 15 insurance companies were licensed to write insurance in the Canal Zone. These companies reported that as of December 31, 1938, a total of 1,260 policies were in force. During the calendar year 1939, 258 policies were issued and 136 canceled, leaving 1,392 in force as of December 31, 1939, having an aggregate face value of \$5,092,985.83. Annual premium collections during the calendar year 1939 totaled \$217,584.86.

During the calendar year 1939 the premiums received by miscellaneous insurance companies, including accident, automobile liability, fire, surety, fidelity, etc., but excluding life insurance, amounted to \$97,826.31. Losses paid during the year totaled \$17,403.48.

The taxes of 1½ percent on premiums by all classes of insurance companies amounted to \$4,731.19 for the calendar year 1939, as compared with \$4,156.27 during the previous year.

COMMERCIAL AVIATION

The following information presents a brief summary of commercial aviation activity in the Canal Zone for the fiscal year 1940, and where available, comparative figures for the years 1938 and 1939.

Number of passengers carried by regularly scheduled airlines

	1940	1939	1938
Canal Zone and foreign:			
Incoming	6,451	4,374	3,660
Outgoing	6,530	4,436	4,274
Total.....	12,981	8,810	7,934
Trans-Isthmian:			
Embarked Albrook Field	789	2,663	.....
Embarked Franco Field	486	1,663	.....
Total.....	1,266	4,326	4,947
Air express and mail (pounds):	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Entered	88,752	72,365	.....
Cleared	273,116	213,806	.....
Total.....	1 361,868	1 286,171	1 242,948

¹ Does not include transshipped cargo which entered and cleared without being unloaded in the Canal Zone.

It will be noted that the Canal Zone and foreign passenger traffic showed an increase of approximately 47 percent and that there was an increase of approximately 27 percent in the amount of air express carried. The trans-Isthmian passenger traffic showed a large decrease. This is attributable to the decrease in steamship service to the Canal Zone, and to the fact that many trans-Isthmian passengers are carried on the international planes crossing the Isthmus.

SECTION V

FINANCIAL AND STATISTICAL STATEMENTS

Financial statements of major interest relative to the operation of the Panama Canal are presented in this section. These statements are abstracted from the annual report of the accounting department of the Panama Canal.

ACCOUNTING SYSTEM

Accounts are maintained in accordance with statutory rules and regulations and accepted principles of appropriation and fund accounting prescribed for governmental bodies. However, the activities being of a quasi-business nature, the accounting system has been adapted to conform as nearly as practicable to the principles and practices approved by the Interstate Commerce Commission and State boards regulating public utilities as well as to procedures followed by comparable industries in the corporate field.

For purposes of valuating the investment, July 12, 1920, the date on which the Canal was formally declared open to commercial traffic by Presidential proclamation, was fixed as the close of the construction and development period of the Panama Canal.

Interest on the United States Treasury funds advanced up to July 12, 1920, amounting to \$128,991,063; the treaty payment of \$10,000,000 to the Republic of Panama in 1904, and the annual treaty payment aggregating \$2,000,000 to the Republic of Panama from 1913 to 1920 are considered as being construction cost and are so reflected in the capital investment account. Additions to the capital investment account are made from time to time by the inclusion of the cost of new capital additions; deductions are made of the amounts of assets withdrawn through sale and retirement of depreciated items.

Obligations for treaty payments of \$250,000 annually to the Republic of Panama are reflected in the operating accounts beginning with the fiscal year 1921. A new treaty with the Republic of Panama was promulgated July 25, 1939, increasing the annual payments to \$430,000 retroactive to the fiscal year 1934. The additional liability of \$1,080,000, representing back payments due on the increased rentals, was adjusted in the accounts for the fiscal year to cover the authorized increase applicable to prior years, and the current year charge for this was increased to \$430,000.

Depreciation of depreciable property and equipment is charged to operation at accepted rates, the amounts so charged being accrued in offsetting valuation or depreciation reserve accounts. Using account balances as of the beginning of the fiscal year, accrued depreciation is deducted from gross capital to establish the investment upon which interest return is calculated.

Subsequent to the fiscal year 1920, a potential capital interest return of 3 percent has been considered as an unrecorded charge to expenses in determining computed surplus or deficit, while net revenues before interest charges have been used to calculate the actual rate of return on net capital investment.

Based on the foregoing, the gross capital investment at the beginning of the fiscal year 1940 was \$543,150,444.95 which, after deducting depreciation of \$34,141,850.57, leaves a net capital investment of \$509,008,594.38. The net revenues of the Canal during the fiscal year 1940 amounted to \$11,253,773.49 on Canal operation and \$1,033,-886.06 on business operations, a total of \$12,287,659.55. This net revenue is 2.42 percent of the net capital.

OPERATIONS OF THE PANAMA RAILROAD COMPANY

The results from the operations of the railroad proper and its various business units on the Isthmus are shown in detail in the accounts of the Panama Railroad Co. The detailed statement of revenue, expenses, and statistics for all railroad industries, changes in the capital account, and the results from operations of the steamship line appear in the annual report of the Panama Railroad Co. A review of these activities is presented in section II of this report under the heading "Business operations under the Panama Railroad Co."

The result from all Panama Railroad operations on the Isthmus during the fiscal year 1940 was a net revenue of \$2,497,072.70 as compared with \$1,481,847.10 for 1939, an increase of \$1,015,225.60 for the year.

PANAMA CANAL OPERATIONS

The major financial results of Panama Canal operations are presented hereinafter in tables Nos. 1 to 27-A, with supplementary comments and explanations.

The following is a list of all of the tables and bureau reports contained in the annual report of the accounting department. The tables and reports Nos. 28 to 58, inclusive, are not printed because they are concerned principally with details of operations which lack general interest, and their publication would be an unwarranted expense. The complete report for the accounting department, as well as those of the other departments and divisions, is on file at the office of the Governor or at the Washington office of the Panama Canal. For purpose of reference, the complete list of tables and

reports for the accounting department is printed below. Following the list are presented the major tables, Nos. 1 to 27-A, inclusive, with various notes of explanation.

INDEX TO TABLES

Table
No.

1. General balance sheet.
2. Canal general property.
3. Floating plant.
4. Business fixed property.
5. Business equipment.
6. Capital assets, depreciable and nondepreciable.
7. Public works, Republic of Panama.
8. Cash receipts and disbursements, appropriated funds.
9. Cash receipts and disbursements, custodial funds.
10. Accounts receivable, registered and outstanding.
11. Stores (material and supplies).
12. Work in progress.
13. Deferred charges.
14. Capital investment.
15. Accounts payable.
16. Depreciation reserves.
17. Reserve for repairs.
18. Reserve for leave.
19. Deferred credits.
20. Income, expenses, and net revenues (current).
21. Revenues, expenses, and computed surplus.
22. Capital refundments (miscellaneous receipts and Canal appropriations).
23. Balance of revenues and refundments.

DETAILS OF OPERATION FOR PROFIT AND LOSS

(Summaries on tables 20 and 21)

24. Canal revenues.
25. Canal earnings, expenses, and net revenues.
26. Business expenses, revenues, and profit or loss.

MISCELLANEOUS

27. Balances in appropriation and fund accounts.
- 27A. Funded reserves, fiscal year 1940.

ADDENDA NOT PUBLISHED

28. Collections of United States funds by collector.
29. Cost of dredging.
30. Cost of electric current.
31. Cost of water.
32. Postal service—revenues, expenses, and surplus.
33. Postal service—money-order funds balance sheet.
34. Postal service—money orders issued and paid, 1907 to 1940, inclusive.
35. Clubhouse, Postal Money Order and Savings Funds.
36. Clubs and playgrounds—balance sheet.
37. Clubs and playgrounds—income and expenditures.
38. Audited Isthmus pay rolls.
39. Pay-roll deductions.

Table
No.

ADDENDA NOT PUBLISHED—Continued

40. } Silver quarters statistics.
 { Rents and miscellaneous collections, silver employees.
41. Rent collections (gold quarters) from nonemployees.
42. Commissary coupons issued, sold, and honored.
43. Accounts payable registered—Panama Canal.
44. Accounts payable registered—Panama Railroad.
45. Personal injury claims.
46. Injuries and deaths, Panama Canal and Panama Railroad.
47. Injuries and deaths—Payments under various acts.
48. Damages to vessels.
49. Freight and cargo claims.
50. Shipments under Government Losses in Shipment Act (Public, No. 192, 75th Cong.).
51. Report of Canal accounting bureau.
52. Report of Railroad accounting bureau.
53. Report of claims bureau.
54. Report of pay-roll section, claims bureau.
55. Report of auditing bureau.
56. Report of coupon accounting bureau.
57. Report of general bureau (mail, files, and employees' bonds).
58. Report of inspection bureau.

TABLE NO. 1.—General balance sheet, June 30, 1910

ASSETS	
Capital assets:	
Canal general property (table No. 2).....	\$194,791,144.74
Floating plant (table No. 3).....	8,240,364.91
Canal defense property.....	14,055,679.78
Business fixed property (table No. 4).....	33,625,050.60
Business equipment (table No. 5).....	3,823,490.94
Total capital assets (table No. 6).....	\$554,535,730.97
Reimbursable capital expenditures: Public Works, Republic of Panama (table No. 7)....	979,907.09
Custodial funds:	
Special deposit funds—	
Clubhouse funds.....	\$296,005.91
Money-order funds.....	3,295,599.95
Security deposit funds.....	877,712.38
Total special deposit funds (see contra).....	4,469,318.24
Revenue due U. S. Treasury.....	199,401.95
Total custodial funds (table No. 9).....	4,668,723.19
Working assets:	
Appropriated funds:	
With U. S. Treasury.....	\$3,968,741.50
With fiscal officers.....	3,793,418.70
Total appropriated funds (table No. 8).....	7,762,160.20
Accounts receivable (table No. 10).....	1,556,015.79
Stores (table No. 11).....	5,290,310.16
Work in progress (table No. 12).....	191,810.62
Total working assets.....	14,830,296.77
Deferred charges (table No. 13).....	897,024.56
Total assets.....	575,911,682.58

TABLE No. 1—*General balance sheet, June 30, 1940*—Continued

LIABILITIES

Capital investment:		
Net appropriations by Congress	\$430,644,575.06	
Interest during construction	128,991,063.00	
Total capital investment (table No. 14)		559,635,638.06
Special deposit accounts (see contra)		4,469,318.24
Accounts payable (table No. 15)		2,649,026.99
Reserve for repairs (table No. 17)		366,610.01
Reserve for leave (table No. 18)		670,015.78
Deferred credits (table No. 19)		1,004,571.86
Revenues and refundments:		
Net revenues to June 30, 1939	\$258,950,056.07	
Net revenues fiscal year 1940 (table No. 20)	12,287,659.55	
Total net revenues (table No. 21)	271,237,715.62	
Canal depreciation (table No. 16)	22,657,494.63	
Plant depreciation (table No. 16)	13,752,182.98	
Total	307,647,393.23	
Less capital refundments (table No. 22)	300,530,891.59	
Balance revenues and refundments (table No. 23)		7,116,501.64
Total liabilities		575,911,682.58

The terms and arrangement of the foregoing balance sheet follow closely the generally accepted principles of corporate accounting, except as to the last item "Revenues and refundments." The statutes require that receipts for tolls, civil revenues, and net profits on business operations shall be covered into the United States Treasury, and relinquished from control of the Panama Canal.

Funds for current operating expenses and capital construction are appropriated by the Congress, and for accounting purposes are considered as provided from the tolls and other receipts covered into the Treasury. Practically all receipts other than those cited above are repayable to Canal appropriations, and may be reexpended, but as the Canal is deprived of tolls revenue, its principal source of income, the reexpendable receipts are insufficient to provide for operation and maintenance, thus requiring the Canal to submit its expenditure program annually to the Congress.

Total net revenues, appearing under the caption "Revenues and refundments," represent the accumulated operating earnings of the Panama Canal before capital interest charges. This net revenue, however, has been covered into the United States Treasury in the form of tolls and other receipts. It therefore follows that net capital refundments and net revenues earned will always be approximately the same, except for the fluctuation of unexpended appropriated cash and other working capital items.

These various fund requirements leave the Panama Canal balance sheet without an equivalent for the usual corporate "surplus account," since any surplus is included in the tolls covered into the Treasury, by law. However, the equivalent for "surplus account" is shown

in table No. 21, which compares "Total net revenues" of \$271,237,-715.62, appearing on the balance sheet, with the computed interest on the net capital investment, by fiscal years, beginning with 1921, but no interest charge against the Canal is actually made by the United States Treasury.

TABLE No. 2.—*Canal general property, fiscal year 1940*

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
Channels, harbors, and basins.				
Balboa to Pedro Miguel	\$21,309,928.86			\$21,309,928.86
Pedro Miguel to Gatun	113,466,691.77			113,466,691.77
Gatun to Cristobal	12,829,445.51			12,829,445.51
Breakwaters:				
Naos Island	1,075,874.10			1,075,874.10
Colon—East	3,994,727.10			3,994,727.10
Colon—West	4,528,829.57			4,528,829.57
Locks:				
Miraflores	24,644,389.24			24,652,856.75
Barracks for lock guards		\$8,467.51		
Pedro Miguel	16,770,362.46			16,776,469.11
Barracks for lock guards		6,106.65		
Gatun	37,914,498.12			37,914,498.12
Floating caisson	347,868.15			347,868.15
Towing locomotives	1,505,397.32			1,505,397.32
Dams:				
Miraflores	1,228,561.63			1,228,561.63
Pedro Miguel	457,302.32			457,302.32
Madden	9,770,071.06	1,662.35		9,771,733.41
Gatun	10,475,943.56			10,475,943.56
Gatun—Mindi levee	148,974.22			148,974.22
Spillways:				
Miraflores	1,398,684.94			1,398,684.94
Gatun	4,323,538.02			4,323,538.02
Aids to navigation:				
Channel aids	627,656.80			627,656.80
Transit aids	24,191.04			24,191.04
Coastal aids	175,069.78			175,069.78
Lighthouse depot	50,700.85			50,700.85
Wharves and piers:				
Balboa (Nos. 14 to 19)	4,102,186.34			4,102,186.34
Gamboa	295,430.46			295,430.46
Cristobal (Nos. 6, 14, 15)	2,753,278.57			2,753,278.57
Drydocks:				
Balboa	3,645,313.06			3,645,313.06
Cristobal	665,852.92			671,630.14
Block storage shed		5,777.22		
Coaling plants:				
Balboa	2,281,568.35			2,284,568.35
Cristobal	3,679,797.59			3,679,797.59
Dredging division plant	870,736.05			890,496.05
Excavator No. 3		19,760.00		
Ferry plants:				
Thatcher ferry plant	588,925.17			588,925.17
Miraflores ferry plant				50,037.61
Landings		42,211.56		
Barge No. 108 (conversion)		7,826.05		
Titles and treaty rights:				
Purchase price, New Panama Canal Co.	31,717,335.97			31,717,335.97
Treaty payment to Republic of Panama, 1901	10,000,000.00			10,000,000.00
Annual treaty payments to Republic of Panama, 1913-20	2,000,000.00			2,000,000.00
Relocation of Panama Railroad	9,800,626.46			9,800,626.46
Reequipment of Panama Railroad	3,217,332.11			3,217,332.11
Depopulation, Canal Zone	2,701,016.24			2,701,016.24
General buildings and structures:				
Office buildings	2,102,599.08			2,102,599.08
Gorgas Hospital	1,816,265.13			1,822,586.56
Steam plant (part)		11,613.30		
Boilers, retired			\$3,430.68	
Laboratory building, retired			1,861.19	
Corral Hospital	549,263.22			549,263.22
Colon Hospital	349,127.20			349,324.27
Utility building (completed)		197.07		
Dispensaries	243,203.32			243,203.32
Palo Seco colony	130,616.55			140,218.40
Ward building No. 20 (part)		22,101.85		
Chapel and rest room, retired			800.00	
Patients' quarters, female, retired			2,700.00	

¹ Original purchase price of \$40,000,000, less Panama Railroad Co. capital stock and sales and transfers of property acquired.

TABLE NO. 2.—*Canal general property, fiscal year 1940—Continued*

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
General buildings and structures—Con.				
Quarantine stations	\$65,392.70			\$65,392.70
Other health department structures	116,787.53			116,787.53
Clubs and playgrounds	299,123.28			295,600.51
Gymnasium, Balboa (completed)		\$2,681.33		
Silver play shed, Gamboa (com- pleted)		112.64		
Play shed, New Cristobal (com- pleted)		641.05		
Bathhouse, Far Fan Beach, retired			\$6,957.79	
Post offices	233,245.34			233,245.34
Schoolhouses	1,830,086.65			1,833,377.08
Shop school building, Balboa (com- pleted)		3,290.43		
Fire stations	126,148.52			121,749.77
Ancon, No. 362, retired			4,398.75	
Police stations	293,735.79			284,387.98
Pedro Miguel, No. 233 (completed)		552.19		
Pedro Miguel, No. 119, retired			9,900.00	
Prisons	30,000.00			30,000.00
Courthouses	187,732.73			187,732.73
Other buildings and structures	449,694.74			490,421.33
Building No. 778, Balboa, relocate		5,408.91		
Paint and carpenter shop, Gatun locks (part)		35,317.68		
Permanent town sites	1,894,257.81			1,973,990.01
Ancon		33,514.53		
Balboa		9,021.14		
Gatun		809.92		
Cristobal		3,770.58		
Silver City		5,116.03		
Fill near Gaillard Highway, Balboa		27,500.00		
Roads, streets, and sidewalks	4,870,072.97			5,013,471.99
Ancon		25,247.41		
Balboa		29,827.81		
Cristobal		7,627.78		
Silver City		14,473.77		
Surveys, New Gamboa Road		48.15		
Road, Corozal Cemetery		113.15		
Road, Tivoli-Calidonia crossings		39,108.29		
Relocation, Bolivar Highway at Fort Davis		8,782.95		
Road, Gaillard Highway to Miraflores Lake		18,169.71		
Sewer system	750,135.69			796,010.81
Ancon		30,281.73		
Balboa		2,452.07		
Gatun		2,025.34		
Cristobal		1,228.67		
Silver City		9,887.31		
Street lighting system	205,447.96			213,802.01
Ancon		923.20		
Balboa		4,295.04		
Gamboa		551.52		
Gatun		929.71		
Cristobal		1,515.60		
Silver City		138.98		
Plans for increasing capacity of Canal	135,000.05	280,000.00		415,000.05
Interest during construction period	128,991,063.00			128,991,063.00
Total, Canal general property	494,090,104.97	731,088.18	30,048.41	494,791,144.74

TABLE No. 3.—*Floating plant, fiscal year 1940*

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
Tugs and craneboats	\$2, 658, 761. 53			\$2, 658, 761. 53
Launches	414, 054. 75			475, 111. 79
<i>Grouper</i> , new (completed)		\$14, 837. 98		
<i>Gull</i> , engine retired		2, 285. 88	\$2, 929. 06	
<i>Morlin</i> , new (completed)		5, 342. 84		
<i>Perico</i> , new		5, 342. 84		
<i>Pompano</i> , new		8, 687. 91		
<i>Sauv Fish</i> , new		8, 687. 92		
<i>Sea Devil</i> , new		5, 342. 85		
<i>Snapper</i> , new		13, 457. 85		
<i>Wahoo</i> , new (completed)				
Dredges	2, 570, 236. 01			2, 570, 236. 01
Dump scows	1, 550, 530. 73			1, 561, 320. 33
No. 185, new (part)		10, 780. 60		
Machine barges	515, 708. 19			782, 187. 83
Relay barge, 24", new		201, 128. 99		
Drill barge, new (part)		35, 350. 65		
Lighters	203, 007. 72			192, 717. 42
Utility barge, No. 35 (completed)		553. 83		
Sand barge, new (part)		1, 342. 93		
No. 188, retired			5, 872. 06	
No. 194, retired			6, 285. 00	
Total, floating plant	7, 942, 298. 96	313, 152. 07	15, 086. 12	8, 240, 364. 91

TABLE No. 4.—*Business fixed property, fiscal year 1940*

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
Hydroelectric plant, Gatun	\$1, 755, 785. 01			\$1, 755, 785. 01
Diesel electric plant, Miraflores	1, 525, 616. 79			1, 525, 616. 79
Substations	1, 432, 692. 15			1, 492, 084. 95
Additions, Miraflores		\$32, 782. 80		
Additions, Summit		26, 610. 00		
Transmission system	1, 560, 695. 81			1, 560, 695. 81
Distribution system	1, 653, 224. 13			1, 798, 907. 88
Ancon		6, 237. 87		
Balboa		17, 615. 93		
Pedro Miguel		2, 600. 00		
Gatun		4, 044. 99		
Cristobal		17, 812. 82		
Silver City		3, 637. 95		
Balboa-West Side Canal		51, 776. 32		
Fort Clayton-Coroza		5, 650. 00		
Frequency changer, Balboa		36, 307. 87		
Madden dam system	1, 302, 275. 85			1, 302, 275. 85
Total, electric power system	9, 230, 289. 74	205, 076. 55		9, 435, 366. 29
Electric work	234, 502. 12			234, 502. 12
Zone water system	1, 192, 246. 41			1, 243, 696. 70
Pumps, Paraiso pump station		14, 381. 31		
Water mains, Miraflores-West Side Canal		93. 01		
Distribution lines:				
Ancon		7, 405. 45		
Balboa		2, 031. 16		
Gatun		2, 055. 18		
Cristobal		1, 442. 19		
Silver City		5, 325. 74		
Holliver Highway-Gatun locks		22, 014. 25		
Air compressor, Miraflores pump station, retired			\$3, 298. 00	
Zone-Panama water system	1, 928, 888. 15			2, 011, 517. 85
4-way valve, Miraflores filter plant, replaced		2, 796. 12	4, 000. 00	
Wash water controller, Miraflores filter plant (part)		789. 22		
Water mains				
Gambon to Miraflores, replaced		36, 319. 36	20, 000. 00	
Gambon to Paraiso		55, 473. 98		
Pump station, Paraiso (part)		10, 065. 83		
Pumps, Gambon pump station (part)		1, 155. 20		

TABLE NO. 4.—*Business fixed property, fiscal year 1940*—Continued

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
Zone-Colon water system.....	\$788,035.78			\$787,913.38
Filter tables and valves, Mount Hope filter plant, replaced.....		\$2,877.60	\$3,000.00	
Total water system.....	3,909,170.34	164,255.60	30,298.00	4,043,127.94
Municipal engineering work.....	123,168.37			123,218.12
Field office and plant, Ancon.....		49.75		
Balboa shops.....	2,507,631.03			2,507,631.03
Cristobal shops.....	580,866.47			580,866.47
Total, mechanical shops.....	3,088,497.50			3,088,497.50
Balboa fuel oil plant.....	910,751.01			910,751.01
Cristobal fuel oil plant.....	1,181,411.49			1,234,680.73
Storage tank, Mount Hope (part).....		53,269.24		
Total, fuel-oil plants.....	2,092,162.50	53,269.24		2,145,431.74
General storehouses.....	1,323,547.25			1,340,502.26
Storage shed, section "G," Balboa.....		1,113.80		
Storage shed, section "K," Balboa.....		333.38		
Building 48, Balboa, addition.....		15,507.83		
Motor transportation.....	157,754.00			157,754.00
Motorcar repair shops.....	127,214.47			197,839.74
Shop building, Cristobal.....		70,625.27		
Building division.....	74,461.38			74,461.38
Gold quarters.....	8,995,199.89			10,403,774.55
New quarters:				
Balboa.....		974,945.30		
Gamboa.....		63,072.34		
Gatun.....		158,320.73		
Cristobal.....		208,005.77		
Alterations, Balboa.....		1,127.76		
Garages, Ancon, transfer.....		3,664.93		
Miscellaneous additions.....		2,437.83		
Retirements, various.....			3,000.00	
Silver quarters.....	1,189,092.06			1,296,334.99
New quarters:				
Mount Hope.....		38,063.94		
Silver City.....		61,418.89		
Bathhouse and cook shed, Camp Biedr.....		2,014.55		
Building 400, Gamboa:				
Transfer.....		3,963.89		
Conversion.....		1,781.66		
Garages.....	256,594.08			252,491.09
New stalls, Ancon.....		1,069.17		
Transfers, Ancon.....			3,664.93	
Building 500, red tank, retired.....			1,507.23	
District quartermasters' supplies.....	48,480.69			48,480.69
Clubhouse business structures.....	764,180.23			783,268.19
Bathhouse, Far Fan Beach.....		23,051.85		
Building 400, Gamboa, transferred.....			3,963.89	
Total, business fixed property.....	31,614,314.62	2,053,170.03	42,434.05	33,625,050.60

TABLE NO. 5.—*Business equipment, fiscal year 1940*

	Balance, July 1, 1939	Additions and transfers	Retirements and transfers	Balance, June 30, 1940
Electric power system.....	\$249,025.03	\$35,390.88		\$284,415.91
Electric work.....	9,981.85			9,981.85
Municipal engineering work.....	348,768.44	46,417.84	\$983.40	394,202.88
Mechanical shops.....	2,030,091.91	179,107.44	28,960.42	2,180,238.93
General storehouses.....	112,739.94	1,584.00		114,323.94
Motor transportation.....	450,182.02	161,137.60	36,662.33	574,657.29
Motorcar repair shops.....	50,857.12			50,857.12
Building division.....	79,975.63	25,711.36		105,686.99
Panama Canal Press.....	96,757.87	8,686.94	401.98	105,042.83
District quartermasters' supplies.....	18,383.82	612.02	14,912.64	4,083.20
Total, business equipment.....	3,446,763.63	458,648.08	81,920.77	3,823,490.94

TABLE No. 6.—*Capital assets, depreciable and nondepreciable, fiscal year 1940*

	Depreciable	Nondepreciable ¹	Balance, June 30, 1940
Canal general property:			
Channels, harbors, and basins		\$150,606,066.14	\$150,606,066.14
Breakwaters		9,599,430.77	9,599,430.77
Locks	\$65,920,857.16	15,276,232.29	81,197,089.45
Dams:			
Madden	5,507,239.22	4,264,494.19	9,771,733.41
Other		12,310,781.73	12,310,781.73
Spillways	3,791,569.33	1,930,633.63	5,722,222.96
Aids to navigation	877,618.47		877,618.47
Wharves and piers	7,150,895.37		7,150,895.37
Dry docks	3,338,521.66	978,421.54	4,316,943.20
Coaling plants	5,964,365.94		5,964,365.94
Dredging division plant	890,496.05		890,496.05
Ferry plants	638,962.78		638,962.78
Titles and treaty rights		59,466,310.78	59,466,310.78
Office buildings	2,102,599.08		2,102,599.08
Gorgas Hospital	1,822,586.56		1,822,586.56
Corozal Hospital	549,263.22		549,263.22
Colon Hospital	349,324.27		349,324.27
Dispensaries	243,203.32		243,203.32
Palo Seco colony	149,218.40		149,218.40
Quarantine stations	65,392.70		65,392.70
Other health department structures	116,787.53		116,787.53
Playgrounds	295,600.51		295,600.51
Post offices	233,245.34		233,245.34
School houses	1,833,377.08		1,833,377.08
Fire stations	121,749.77		121,749.77
Police stations	284,387.98		284,387.98
Prisons	30,000.00		30,000.00
Courthouses	187,732.73		187,732.73
Other buildings and structures	490,421.33		490,421.33
Permanent town sites		1,973,990.01	1,973,990.01
Roads, streets, and sidewalks		5,013,471.99	5,013,471.99
Sewer system		796,010.81	796,010.81
Street lighting system		213,802.01	213,802.01
Plans for increasing capacity of Canal		115,000.05	115,000.05
Interest during construction period		128,991,063.09	128,991,063.09
Total, Canal general property (table No. 2)	102,955,415.80	391,835,728.94	494,791,144.74
Floating plant (table No. 3)	8,240,364.91		8,240,364.91
Canal defense property (incomplete)		11,055,679.78	11,055,679.78
Business fixed property (table No. 4)	33,625,050.60		33,625,050.60
Business equipment (table No. 5)	3,823,490.94		3,823,490.94
Total, capital assets	148,644,322.25	405,891,408.72	554,535,730.97

¹ Channels, harbors, basins, breakwaters, and municipal assets are maintained at original values from current operating expenses. Other nondepreciable property includes excavation and earth fill at locks, dams, and drydocks, and earth saddles at Madden Dam; also certain projects which were incomplete at the close of the fiscal year.

TABLE No. 7.—*Public works in cities of Panama and Colon, fiscal year 1940*

	Panama	Colon	Total
Status of capital cost to June 30, 1940:			
Construction cost:			
Waterworks and sewers	\$876,353.22	\$623,883.68	\$1,500,236.90
Pavements	592,913.23	625,619.03	1,218,532.26
Total construction cost	1,469,266.45	1,249,502.71	2,718,769.16
Amortization:			
Waterworks and sewers	554,587.59	391,686.20	949,273.79
Pavements	381,168.98	408,479.30	789,588.28
Total amortization	935,666.57	803,165.50	1,738,862.07
Capital cost reimbursable:			
Waterworks and sewers	321,765.63	229,197.48	550,963.11
Pavements	211,804.25	217,139.73	428,943.98
Capital value, June 30, 1940	533,569.88	446,337.21	979,907.09

TABLE No. 7.—*Public works in cities of Panama and Colon, fiscal year 1940—Con.*

	Panama	Colon	Total
Operating detail, fiscal year, 1940:			
Operation, maintenance, and repairs:			
Waterworks and sewers.....	\$167,329.73	\$126,642.84	\$293,972.57
Pavements.....	11,577.79	1,726.23	13,304.02
Proportion, Zone system.....	87,710.35	36,448.82	124,159.17
Street cleaning and garbage collection.....	92,359.73	42,675.33	135,035.06
Total.....	358,977.60	207,493.22	566,470.82
Interest at 2 percent per annum:			
Waterworks and sewers.....	6,572.56	4,681.70	11,254.26
Pavements.....	4,326.42	4,435.41	8,761.83
Proportion, Zone system.....	11,861.99	6,045.66	17,907.65
Total.....	22,760.97	15,162.77	37,923.74
Amortization:			
Waterworks and sewers.....	18,514.23	13,187.90	31,702.13
Pavements.....	12,187.10	12,494.11	24,681.21
Total.....	30,701.33	25,682.01	56,383.34
Total charged to water rentals.....	412,439.90	248,338.00	660,777.90
Water rental collections in the Republic of Panama.....	412,439.90	248,338.00	660,777.90

The Panama Canal supplies water to the cities of Panama and Colon from the Canal Zone water system, and maintains the sewers and streets in the two cities under a contract entered into between the Panama Canal and the Republic of Panama in 1907. The Panama Canal collects the water rentals from the residents of these two cities and uses the funds to cover the cost of water and maintenance of sewers and streets, interest on the unamortized investment at 2 percent per annum, and amortization based on 50 years from 1907.

Interest on the investment amounting to \$37,923.74 and amortization amounting to \$56,383.34 for fiscal year 1940 have been covered into the United States Treasury as miscellaneous receipts, making the totals to date, \$1,683,121.65 for interest, and \$1,738,862.07 for amortization.

TABLE NO. 8.—Receipts and disbursements, fiscal year ended June 30, 1940

APPROPRIATED FUNDS

	Disbursing clerk, Wash- ington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
Accountable balance July 1, 1939, by appropriations and funds:						
Maintenance and operation, Panama Canal	\$293,315.75	\$1,429,329.00	\$85,737.32	\$1,778,382.97	\$3,817,588.96	\$5,595,971.93
Sanitation, Canal Zone, Panama Canal	8,525.22	11,438.88	30,513.71	50,477.81	41,302.48	94,780.29
Civil government, Panama Canal and Canal Zone	2,451.96	66,353.51	2,502.50	71,307.97	69,057.19	137,365.16
Postal funds, Canal Zone (special fund)	4,960.83	9,368.02	56,720.39	71,049.21	39,291.62	110,340.86
Repatriation of unemployed aliens, Panama Canal	2,208.58	8,486.13		8,494.71	90,000.00	98,386.13
Memorial to Maj. Gen. George W. Goethals				2,208.58	156,000.00	158,208.58
Total	311,462.34	1,524,876.44	145,473.92	1,981,812.70	4,213,240.25	6,195,052.95
Appropriation for fiscal year 1940:						
Maintenance and operation, Panama Canal					22,823,087.00	22,823,087.00
Sanitation, Canal Zone, Panama Canal					1,004,535.00	1,004,535.00
Civil government, Panama Canal and Canal Zone					1,180,802.00	1,180,802.00
Total					25,008,424.00	25,008,424.00
Transfers between fiscal officers:						
Maintenance and operation, Panama Canal	15,000,000.00	17,793,618.83		32,793,618.83	124,968.60	32,918,587.43
Sanitation, Canal Zone, Panama Canal	125,000.00	1,715,632.33		1,840,632.33	87,532.83	1,928,165.16
Civil government, Panama Canal and Canal Zone	40,000.00	1,284,303.19		1,324,303.19	23,777	1,324,325.96
Postal funds, Canal Zone (special fund)	29,000.00	278,500.00		307,500.00	468,309.14	775,809.14
Repatriation of unemployed aliens, Panama Canal						
Total	15,194,000.00	21,072,054.35		36,266,054.35	680,833.34	36,946,887.69
Collections repayable to appropriations:						
Maintenance and operation, Panama Canal	123,754.00	248,660.71	10,253,853.75	10,626,268.46	5,722.67	10,631,991.13
Sanitation, Canal Zone, Panama Canal	86,468.43	62.98	729,236.32	815,767.73	181.91	815,953.64
Civil government, Panama Canal and Canal Zone	22.77		133,497.85	133,520.62	1,277.86	134,798.48
Postal funds, Canal Zone (special fund)			489,978.00	489,978.00		489,978.00
Total	210,245.20	248,723.69	11,606,565.92	12,065,534.81	7,186.44	12,072,721.25
Total cash debits	15,715,707.54	22,815,654.48	11,752,039.84	50,313,401.86	29,909,684.03	80,223,085.89
Covered into the U. S. Treasury: Business net revenues, fiscal year 1939, main- tenance and operation, Panama Canal					642,052.74	642,052.74

Transfers between fiscal officers:

Maintenance and operation, Panama Canal	124,916.53	10,268,670.90	10,366,587.43	22,525,000.00	32,918,587.43
Sanitation, Canal Zone, Panama Canal	57,532.83	740,632.33	828,165.16	1,100,000.00	1,928,165.16
Civil government, Panama Canal and Canal Zone	22.77	134,303.19	134,325.96	1,190,000.00	1,324,325.96
Postal funds, Canal Zone (special fund)		468,309.14	468,309.14	307,500.00	775,809.14
Total	212,472.13	11,611,915.56	11,824,387.69	25,122,500.00	36,946,887.69
Disbursements:					
Maintenance and operation, Panama Canal	14,556,698.44		31,284,004.77	5,462.94	31,289,467.71
Sanitation, Canal Zone, Panama Canal	127,318.43		1,814,626.87	4,792.11	1,819,418.98
Civil government, Panama Canal and Canal Zone	33,466.96		1,307,523.52	477.15	1,308,000.67
Postal funds, Canal Zone (special fund)	24,019.68		284,822.38	135,657.59	420,479.97
Reparation of unemployed aliens, Panama Canal			2,917.93		2,917.93
Memorial to Maj. Gen. George W. Goethals	1,700.00		1,700.00		1,700.00
Total	14,743,203.51		34,695,595.47	146,380.79	34,841,985.26
Accountable balance June 30, 1940:					
Maintenance and operation, Panama Canal	735,454.78	40,920.17	3,520,678.06	3,598,851.55	7,119,529.61
Sanitation, Canal Zone, Panama Canal	5,192.39	19,117.70	64,085.84	31,764.11	95,849.95
Civil government, Panama Canal and Canal Zone	8,383.00	1,697.16	87,282.30	57,682.67	144,964.97
Postal funds, Canal Zone (special fund)	9,941.15	78,389.25	115,395.72	64,443.17	179,838.89
Reparation of unemployed aliens, Panama Canal			5,468.20	96,000.00	95,438.20
Memorial to Maj. Gen. George W. Goethals	508.58		508.58	156,000.00	156,508.58
Total	760,031.90	140,124.28	3,793,418.70	3,998,741.50	7,792,160.20
Total cash credits	15,715,707.54	11,752,039.84	50,313,401.86	29,907,684.03	80,223,085.89

TABLE No. 9.—Receipts and disbursements, fiscal year ended June 30, 1940
CUSTODIAL FUNDS

	Disbursing clerk, Wash- ington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
Accountable balance July 1, 1939:						
Revenue due U. S. Treasury				\$145,989.66		\$145,989.66
Security deposits	\$99.59		696,119.05	696,119.05		696,119.05
Clubhouse funds			1,913.01	1,913.01	\$181,427.39	186,510.40
Money order funds			27,961.95	27,961.95	22,815,121.81	2,813,083.76
Total	99.59		872,914.08	873,013.67	2,999,719.20	3,872,762.87
Receipts:						
Revenue due U. S. Treasury	903.13	\$106.20	21,373,682.76	21,374,692.09		21,374,692.09
Security deposits	50,761.08	6,729,942.51	27,932,969.27	31,713,676.46		31,713,676.46
Clubhouse funds			1,328,085.80	1,328,085.80		1,328,085.80
Money order funds			3,862,370.81	3,862,370.81		3,862,370.81
Total	51,667.81	6,730,048.71	54,437,708.67	61,219,425.19		61,219,425.19
Total to be accounted for						
Transfer to U. S. Treasury:	51,767.40	6,730,048.71	55,310,622.75	62,092,438.86	2,999,719.20	65,092,158.06
Clubhouse funds						
Money order funds						
Total cash debits	51,767.40	6,730,048.71	50,210,258.07	57,022,074.18	8,070,113.88	65,092,188.06
Covered into the U. S. Treasury: Revenue due U. S. Treasury						
Transfers and refunds: Security deposits	903.13	106.20	21,321,267.47	21,322,276.80		21,322,276.80
Disbursements:	18,588.14	6,729,942.51	27,783,582.48	34,592,113.13		34,592,113.13
Clubhouse funds						
Money order funds						
Total	19,491.27	6,730,048.71	49,166,223.11	55,915,763.69	4,567,701.78	60,423,464.87
Accountable balance June 30, 1940:						
Revenue due U. S. Treasury				199,404.95		199,404.95
Security deposits	32,276.13		845,436.25	877,712.38		877,712.38
Clubhouse funds			5,755.67	5,755.67		5,755.67
Money order funds			23,438.09	23,438.09	290,250.24	296,045.91
Total	32,276.13		1,074,031.96	1,106,311.09	23,272,161.86	3,295,599.95
Total cash credits	51,767.40	6,730,048.71	50,240,258.07	57,022,074.18	8,070,113.88	65,092,188.06

* Denotes deduction.

* Includes \$1,908,092.13 invested in U. S. Treasury bonds and \$290,262.26 in Federal farm loan bonds, total \$2,198,354.39.

Custodial funds cover cash transactions which are controlled by separate fiscal regulations from those which govern the expenditure of appropriations made by Congress for maintenance and operation of the Panama Canal.

Revenue due United States Treasury covers collections for deposit as miscellaneous receipts of the United States Government which form no part of the working cash of the Panama Canal, as these funds must by law immediately be covered into the United States Treasury and relinquished from control of the Panama Canal. These collections consist mainly of tolls, licenses, court fees and fines, and amortization of public works in Panama and Colon.

Security deposits cover cash received by Canal fiscal officers from banks, individuals, and companies to guarantee payment of bills rendered by the Panama Canal and the Panama Railroad Co., and to guarantee fulfillment of contracts. Disbursements of these funds represent transfers to revenue due United States Treasury on this table, collections repayable to appropriations on the preceding table, and the return of unexpended balances to depositors.

Special deposit funds cover certain activities conducted by the Canal Zone Government separately from appropriations, principally postal money order funds, and transactions of Panama Canal club-houses maintained exclusively for employees.

TABLE No. 10.—*Accounts receivable*
REGISTERED DURING THE YEAR

	Fiscal year 1940	Fiscal year 1939
Repaid to appropriations:		
Panama Railroad Co.	\$2, 812, 087. 70	\$1, 945, 679. 17
Other departments of the U. S. Government	3, 519, 876. 84	2, 157, 844. 42
Individuals and companies	3, 767, 766. 13	3, 429, 330. 14
Total	10, 099, 730. 67	7, 532, 853. 73
Miscellaneous receipts:		
Tolls	21, 177, 759. 82	23, 699, 430. 02
Public works, Republic of Panama	94, 307. 08	95, 603. 80
Miscellaneous	7. 02	.....
Total	21, 272, 073. 92	23, 795, 033. 82
Total accounts receivable registered	31, 371, 804. 59	31, 327, 887. 55
Number of bills registered	40, 502	37, 474

ACCOUNTS RECEIVABLE END FISCAL YEAR

Audited bills	\$1, 513, 698. 91	\$703, 430. 16
Hospital certificates	36, 340. 73	30, 768. 68
Injury compensation	5, 910. 78	4, 057. 40
Unredeemed commissary coupons	65. 37	109. 40
Total	1, 556, 015. 79	738, 365. 94

The balance at the end of the fiscal year includes all accounts due the Panama Canal except items of utility service, principally for employees, which are not credited to earnings until collected usually by pay-roll deductions.

TABLE NO. 11.—*Materials and supplies*

	Fiscal year 1940	Fiscal year 1939
Stock on hand, first of year:		
Balboa store	\$2,708,937.81	\$3,126,890.74
Medical store	84,779.43	84,021.33
Administration building store	31,616.09	26,424.52
Gamboa store	401,078.94	440,526.08
Cristobal store	589,396.81	582,343.89
Locks store	534,830.86	555,585.09
Fuel oil plants	54,957.08	145,041.59
Panama Canal Press	76,686.61	80,498.41
Sand and gravel pile	170,113.78	77,660.59
Division stores	177,780.46	207,736.45
Total stock card value	4,920,177.87	5,326,728.69
Reserve for inventory adjustments	277,260.89	313,860.70
Book value of stock on hand	4,642,916.98	4,982,867.99
Receipts of material:		
Purchases for stock	8,586,612.47	3,773,641.08
Purchases for divisions	4,879,369.72	484,445.16
Local production	1,315,625.33	826,336.89
Service charges	867,362.35	358,739.02
Book value of receipts	15,648,969.87	5,443,162.15
Total charges to stock	20,291,886.85	10,426,030.14
Issues and sales of material:		
Issues to business divisions	11,253,535.00	3,097,826.11
Issues to Canal divisions	1,394,056.66	1,362,089.00
Variation in division stores	(47,713.87)	29,955.99
Total issues	12,599,877.79	4,489,871.10
Sales	2,401,698.90	1,293,242.06
Total issues and sales	15,001,576.69	5,783,113.16
Stock on hand, end of year:		
Balboa store	3,196,623.96	2,708,937.81
Medical store	67,974.23	84,779.43
Administration building store	40,280.41	31,616.09
Gamboa store	388,485.44	401,078.94
Cristobal store	740,239.21	589,396.81
Locks store	532,708.80	534,830.86
Fuel oil plants	103,455.06	54,957.08
Panama Canal Press	104,885.13	76,686.61
Sand and gravel pile	135,057.30	170,113.78
Division stores	225,494.33	177,780.46
Total stock card value	5,535,203.87	4,920,177.87
Reserve for inventory adjustments	244,893.71	277,260.89
Book value of stock on hand	5,290,310.16	4,642,916.98

In the foregoing table, the values of stock on hand at the beginning and end of the year are shown at invoiced cost including ocean freight.

The storehouse stock-card price includes an added percentage to cover handling cost. This item is shown as "Service charges" under receipts of material and is also reflected in the total of sales and issues.

TABLE NO. 12.—*Work in progress*

	Fiscal year 1940	Fiscal year 1939
Electrical division	\$1,918.81	\$2,841.37
Municipal division	65.94	31.05
Shops and drydocks	160,636.57	109,637.11
Building division	26,611.04	64.18
Panama Canal Press	2,578.26	7,241.88
Total	191,810.62	119,815.59

This account covers the amounts expended on uncompleted jobs and will ultimately be cleared to operating expenses of the divisions indicated, with corresponding credits to their revenues after application of authorized surcharge.

TABLE No. 13.—*Deferred charges*

	Fiscal year 1940	Fiscal year 1939
Clubs and playgrounds.....		\$125.34
Health department.....	\$877.28	385.56
Office engineer.....		1,103.79
Special engineering division.....		27,611.92
Chief quartermaster's office.....	415.00	
Port captain, Balboa.....	4,272.12	1,503.02
Lighthouse subdivision.....	510.89	282.55
Dredging division.....	207,712.02	208,687.41
General accounts, suspense.....	31,142.71	1,297.13
Electric work.....	2,914.66	
Water system.....	1,200.00	1,235.00
Municipal work.....	66,498.82	6,806.33
Shops and drydocks.....	91,316.42	43,877.58
Fuel oil plants.....	695.07	142.90
General storehouses.....	30,300.27	3,353.44
Building division.....	206,165.25	125,621.53
Silver quarters.....		700.00
District quartermaster's supplies.....	5,797.66	2,565.85
Public works, Panama.....	174,926.17	77,010.45
Public works, Colon.....	72,280.22	47,216.03
Total.....	897,024.56	549,525.83

This account covers expenses incurred for account of divisions indicated, but which are not chargeable to operating accounts of the current year. These amounts are cleared as soon as values are consumed.

TABLE No. 14.—*Capital investment*

Appropriations for Canal construction to June 30, 1921 (detail in annual report for 1924, table No. 3).....	\$386,910,301.00
Deduct value of capital stock of the Panama Railroad Co.....	7,000,000.00
Net construction appropriations.....	379,910,301.00
Annual payments to the Republic of Panama, 1913 to 1920 (State Department).....	2,000,000.00
Additional construction funds, July 1, 1921, to June 30, 1940.....	48,734,274.06
Total cash investment.....	430,644,575.06
Interest on construction funds (compounded annually), 1904 to 1920.....	128,991,063.00
Total capital investment.....	559,635,638.06

The capital investment account covers the following assets, showing the total as of June 30, 1939, the increase for the current fiscal year, and the total as of June 30, 1940.

	June 30, 1939	Increase	June 30, 1940
Canal general property (table No. 2).....	\$494,090,104.97	\$701,039.77	\$494,791,144.74
Floating plant (table No. 3).....	7,942,298.96	298,065.95	8,240,364.91
Canal defense property.....	900,672.34	13,155,007.44	14,055,679.78
Business fixed property (table No. 4).....	31,614,314.62	2,010,735.98	33,625,050.60
Business equipment (table No. 5).....	3,446,763.63	376,727.31	3,823,490.94
Public works, Republic of Panama (table No. 7).....	1,036,290.43	156,383.34	979,907.09
Proportion of working capital (table No. 23).....	4,120,000.00		4,120,000.00
Total capital assets.....	543,150,444.95	16,485,193.11	559,635,638.06
Less accrued depreciation (table No. 16).....	34,141,850.57	2,267,827.04	36,409,677.61
Net capital investment.....	509,008,594.38	14,217,366.07	523,225,960.45

¹ Denotes decrease.

The total capital investment at the close of the fiscal year 1940 amounted to \$559,635,638.06. The increase of \$16,485,193.11 is due to the making of necessary additions to plant and equipment as shown in capital tables Nos. 2, 3, 4, and 5.

Interest on the net capital investment from 1922 to date is considered as a charge to operating expenses, and while this charge does not appear on the balance sheet, a statement of such interest compared with net revenues, by years, is shown on table No. 21. Interest for the current fiscal year is based upon a net capital investment of \$508,107,922.04, as of June 30, 1939, which is the above net capital investment of \$509,008,594.38 less Canal defense property, \$900,-672.34 and amounts to \$15,243,237.66.

TABLE NO. 15.—*Accounts payable*

	Fiscal year 1940	Fiscal year 1939
United States invoices.....	\$536,424.17	\$178,976.36
Isthmian vouchers.....	167,304.45	85,391.06
Current pay rolls.....	1,899,068.85	1,155,895.50
Unpaid salaries and wages.....	43,219.78	27,241.40
Drums, carboys, and reels.....	8,551.02	8,101.27
Local purchases.....	1 5,541.28	1 2,032.43
Total.....	2,649,026.99	1,453,573.16

¹ Denotes debit.

The above table covers all current obligations of the Panama Canal, except deposits to guarantee payment of bills, and special deposit funds, all of which are covered by table No. 9, custodial funds.

TABLE NO. 16.—*Depreciation reserves, fiscal year 1940*

CANAL DEPRECIATION

	Balance, July 1, 1939	Accruals	Retirements	Balance, June 30, 1940
Locks.....	\$11,573,920.67	\$493,395.69	.....	\$12,067,316.36
Madden Dam.....	219,412.09	55,072.39	.....	274,484.48
Spillways.....	511,692.48	21,320.52	.....	533,013.00
Aids to navigation.....	380,700.25	12,038.88	.....	392,739.13
Wharves and piers.....	2,248,714.82	144,324.60	.....	2,393,039.42
Drydocks.....	773,801.69	42,394.54	.....	816,196.23
Coaling plants.....	3,188,316.60	150,687.52	.....	3,339,004.12
Dredging division plant.....	438,311.09	21,064.51	.....	460,275.60
Ferry plants.....	205,617.21	29,391.03	.....	235,038.24
Office buildings.....	415,005.38	24,449.68	.....	439,455.06
Gorgas Hospital.....	377,227.84	18,069.67	\$5,217.56	390,079.95
Colon Hospital.....	89,754.05	6,224.01	.....	95,978.06
Corozal Hospital.....	71,860.34	4,912.78	.....	76,803.12
Colon Hospital.....	52,725.91	3,301.04	.....	56,026.95
Dispensaries.....	38,638.14	3,407.38	3,360.00	38,685.52
Palo Seco colony.....	65,392.70	.....	.....	65,392.70
Quarantine stations.....	29,017.88	2,402.57	.....	31,420.45
Other health department structures.....	72,022.80	8,217.98	1,948.17	78,292.61
Playgrounds.....	7,236.42	2,590.50	.....	9,826.92
Schoolhouses.....	212,749.84	24,381.71	.....	237,131.55
Fire stations.....	33,379.98	2,541.34	4,090.45	31,830.87
Police stations.....	18,557.01	6,262.05	9,900.00	14,919.06
Prisons.....	5,250.00	750.00	.....	6,000.00
Courthouses.....	84,908.00	3,754.65	.....	88,662.65
Other buildings and structures.....	237,868.32	8,428.58	.....	246,296.90
Contingent reserve.....	135,431.53	109,686.38	5,532.23	239,585.68
Total, Canal depreciation.....	21,487,543.04	1,200,000.00	30,048.41	22,657,494.63

TABLE No. 16.—*Depreciation reserves, fiscal year 1940—Continued*

PLANT DEPRECIATION

	Balance, July 1, 1939	Accruals	Retirements	Balance, June 30, 1940
Floating plant:				
Tugs.....	\$865,495.00	\$98,125.00		\$963,620.00
Launches.....	221,866.17	31,603.68	\$2,929.06	250,630.79
Dredges.....	1,566,100.00	88,080.00		1,654,180.00
Dump scows.....	962,752.60	62,438.19		1,025,190.79
Machine barges.....	290,125.30	24,295.00		314,420.30
Lighters.....	100,932.08	10,048.94	12,157.06	98,823.96
Total, floating plant.....	4,007,271.15	314,680.81	15,086.12	4,306,865.84
Business fixed property:				
Electric power system.....	1,799,559.19	134,520.00		1,934,079.19
Electric work.....	33,222.15	4,689.36		37,911.51
Water system.....	880,849.09	72,360.00	30,298.00	922,911.09
Municipal work.....	4,922.43	2,525.00		7,447.43
Mechanical shops.....	792,366.86	63,484.69		855,851.55
Fuel oil plants.....	783,750.80	83,894.40		867,645.20
General storehouses.....	518,423.36	29,225.69		547,649.05
Motor transportation.....	15,856.14	5,510.00		21,366.14
Motor car repair shops.....	11,904.32	2,712.00		14,616.32
Building division.....	11,251.50	2,106.00		13,357.50
Gold quarters.....	1,458,237.55	188,376.00	3,000.00	1,643,613.55
Silver quarters.....	365,265.49	31,894.57		397,160.06
Garages.....	224,401.12	6,242.19	1,507.23	229,136.08
Clubhouse business structures.....	229,654.26	20,223.82		249,878.08
District quartermasters' supplies.....	8,304.45	2,439.00		10,743.45
Total, business fixed property.....	7,137,968.71	650,202.72	34,805.23	7,753,366.20
Business equipment:				
Electric power system.....	75,982.46	12,456.00		88,438.46
Electric work.....	5,920.57	794.30		6,714.87
Municipal work.....	202,594.76	54,086.74	983.40	255,698.10
Mechanical shops.....	765,095.54	89,667.75	28,960.42	825,862.87
General storehouses.....	67,602.00	6,129.23		73,731.23
Motor transportation.....	247,367.54	83,296.61	36,662.33	294,001.82
Motor car repair shops.....	23,845.01	3,939.00		27,784.01
Building division.....	58,881.95	5,362.78		64,244.73
Panama Canal Press.....	49,164.95	3,947.00	401.98	52,709.97
District quartermasters' supplies.....	12,612.89	5,124.63	14,912.64	2,824.88
Total, business equipment.....	1,509,067.67	264,804.04	81,920.77	1,691,950.94
Total, business fixed property and equipment.....	8,647,036.38	915,006.76	116,726.00	9,415,317.14
Total, plant depreciation.....	12,654,307.53	1,229,687.57	131,812.12	13,752,182.98

SUMMARY

	Balance, July 1, 1939	Accruals	Retirements	Balance, June 30, 1940
Canal depreciation.....	\$21,487,543.04	\$1,200,000.00	\$30,048.41	\$22,657,494.63
Plant depreciation.....	12,654,307.53	1,229,687.57	131,812.12	13,752,182.98
Total depreciation.....	34,141,850.57	2,429,687.57	161,860.53	36,409,677.61

The accrued balance as of June 30, 1940, for Canal depreciation applies to depreciable Canal general property shown on table No. 6, amounting to \$102,955,415.80, and for plant depreciation applies to floating plant, business fixed property, and business equipment, shown in tables Nos. 3, 4, and 5, amounting to \$45,688,906.45.

TABLE NO. 17.—*Reserve for repairs*

	Balance, July 1, 1939	Accruals	Charges	Balance, June 30, 1940
Tugs and cranesboms.....	\$43,369.58	\$82,200.00	\$12,137.00	\$83,432.58
Dredges.....	79,038.86	189,996.00	120,729.22	142,305.64
Dump scows.....	¹ 16,290.57	144,166.73	81,220.51	46,655.65
Machine barges.....	¹ 5,498.26	32,520.00	15,662.79	11,358.95
Lighters.....	14,898.33			14,898.33
Total, floating plant.....	115,517.94	448,882.73	265,749.52	298,651.15
Electric work, fixed property.....	8,019.91	3,371.52		11,391.43
Electric work, equipment.....	24,882.13	37,159.81	36,061.71	25,980.23
Wharves and piers, fixed property.....	¹ 218,800.85		218,800.85	
General storehouses, fixed property.....	15,493.66			15,493.66
Panama Canal press, fixed property.....	2,905.26			2,905.26
District quartermasters' supplies, fixed property.....	8,870.40	1,403.12		10,273.52
Sand and gravel, equipment.....	1,013.98	10,600.20	9,699.42	1,914.76
Total, fixed property and equipment.....	279,986.19	52,534.65	264,561.98	67,958.86
Total reserve for repairs.....	395,504.13	501,417.38	530,311.50	366,610.01

¹ Denotes debit.² This balance (total accruals to June 30, 1939) has been transferred for inclusion with business profits, per table No. 26, and coverage into U. S. Treasury.TABLE NO. 18.—*Reserve for leave*

	Fiscal year 1940	Fiscal year 1939
Electrical division.....	\$145,007.64	\$125,480.51
Municipal division.....	193,017.74	64,989.30
Shops and drydocks.....	233,586.95	172,228.76
Motor transportation.....	23,861.17	16,274.94
Motorcar repair shops.....	19,969.83	15,557.90
Building division.....	54,572.45	32,742.36
Total.....	670,015.78	427,273.77

The foregoing table represents the reserve for vacation pay due employees of the principal business divisions. This reserve is credited by adding a percentage to direct labor charges for work performed by the division listed above to the credit of this account. The account is debited with the amount paid to employees when leave is actually taken.

TABLE NO. 19.—*Deferred credits*

	Fiscal year 1940	Fiscal year 1939
Executive offices.....	\$754.51	\$4,525.01
Comptroller's office.....	2,232.96	1,818.00
Civil government.....	41,324.58	28,595.58
Postal service.....	87,374.58	39,532.83
Health department.....	35,525.29	11,724.11
Office engineer.....	4,835.02	5,369.81
Surveys.....	807.50	250.00
District quartermaster, Balboa.....	28,542.86	5,087.88
District quartermaster, Pedro Miguel.....	90.83	146.76
District quartermaster, Gamboa.....	140.40	161.84
Nautical books and charts.....	1,444.44	1,662.24
Port captain, Balboa.....	1,800.00	
Lighthouse subdivision.....	14,184.35	
Pacific locks.....	32,711.81	30,185.62
Atlantic locks.....	20,310.87	
Dredging division.....	20,065.71	3,100.11
Experimental gardens.....	984.52	543.69
General accounts, suspense.....	66,172.51	44,789.10
Electric power system.....	11,566.59	1,348.30
Electric work.....	8,551.49	98.14

TABLE No. 19.—*Deferred credits*—Continued

	Fiscal year 1940	Fiscal year 1939
Municipal work.....	\$308,937.46	\$148,480.81
Shops and drydocks.....	66,521.78	40,437.20
Fuel oil plants.....	132,553.75	6,849.58
General storerooms.....	67.54	5,538.49
Building division.....	34,480.67	18,371.01
Gold quarters.....	34,480.62	14,500.00
District quartermasters' supplies.....	1,294.54	1,067.39
Contingencies, maintenance and operation.....	15,953.94	45,394.82
Contingencies, sanitation.....	752.67	753.67
Contingencies, civil government.....	148.07	148.07
Total.....	1,004,571.86	460,510.06

This account covers expenses accrued or estimated which have been charged to operating accounts, but for which it was impracticable to institute corresponding payments at close of the accounting period. These amounts are cleared as soon as corresponding charges are passed for payment, or contingent expenses arise.

TABLE No. 20.—*Consolidated statement of income, expenses, and net revenues*

	Fiscal year 1940	Fiscal year 1939
Canal operations:		
Canal revenues:		
Tolls.....	\$21,177,243.04	\$23,699,413.82
Postal surplus.....	15,338.78	18,959.36
Other miscellaneous receipts.....	103,141.97	87,970.19
Total Canal revenues (table No. 24).....	21,295,723.79	23,806,343.37
Canal earnings (table No. 25).....	4,765,307.91	3,695,706.89
Total revenues.....	26,061,031.70	27,502,050.26
Canal expenses:		
Executive offices.....	617,922.36	491,960.17
Playgrounds.....	83,000.00	83,000.00
Accounting department.....	625,598.94	558,597.54
Washington office.....	418,702.32	269,389.50
Civil government.....	1,329,049.98	1,296,688.23
Postal service.....	470,815.12	330,000.00
Health department.....	2,011,682.36	1,709,738.02
Office engineer.....	424,236.73	169,159.61
Special engineering division.....		175,708.75
Section of surveys.....	124,932.96	89,941.01
Public buildings and grounds.....	438,893.44	392,762.22
Marine division.....	1,672,732.11	1,662,888.08
Locks, operation and maintenance.....	1,680,526.96	1,574,569.35
Locks, overhaul.....		433,001.60
Dams and spillway.....	60,160.35	72,161.01
Dredging division.....	2,553,562.86	2,279,558.85
Municipal expenses.....	300,146.15	293,773.73
Railroad tracks maintenance.....	19,959.67	19,981.15
Recruiting and repatriating employees.....	21,408.01	26,654.89
Transportation of employees on Isthmus.....	158,483.78	124,600.54
Damage to vessels.....	13,301.13	50,000.00
Miscellaneous general expenses.....	152,079.98	103,814.82
Depreciation on Canal general property.....	1,200,000.00	1,200,000.00
Annual payment to Republic of Panama.....	430,000.00	250,000.00
Total expenses.....	14,807,258.21	13,660,979.07
Net Canal revenues (table No. 25).....	11,253,773.49	13,841,071.19
Fixed capital charge.....	14,435,030.02	14,458,111.05
Surplus or (deficit).....	¹ 3,181,256.53	¹ 617,039.86
Business operations:		
Business revenues.....	42,946,491.61	18,236,320.31
Business expenses.....	41,912,608.55	17,555,047.83

TABLE NO. 20. — *Consolidated statement of income, expenses, and net revenues—Con.*

	Fiscal year 1910	Fiscal year 1939
Business operations—Continued		
Net business revenues (table No. 26)	\$1,033,886.06	\$681,272.48
Fixed capital charge	808,207.64	792,293.63
Surplus or (deficit)	225,678.42	¹ 111,021.15
Combined operations		
Revenues	69,007,526.31	45,738,370.57
Expenses	56,719,860.76	31,216,026.90
Net revenues	12,287,659.55	14,522,343.67
Fixed capital charge at 3 percent	15,243,237.66	15,250,404.68
Surplus or (deficit)	¹ 2,955,578.11	¹ 728,061.01
Capital investment (table No. 14)	508,107,922.04	508,316,822.50
Combined net revenues	12,287,659.55	14,522,343.67
Percent of capital return	2.42	2.86

¹ Denotes deficit.

A summary comparison of net revenues and capital interest, by years, from 1921 to date, is shown on table No. 21, following, together with a brief description of accounting policy governing charges to operating expenses.

The following table summarizes by classes the revenues received by the Panama Canal by fiscal years from 1921 and shows the net results from operations after deducting therefrom the net current expenses chargeable to appropriations and the current interest charge on the capital investment. The interest rate of 3 percent has been used in making computations a great many years. The use of this rate received the approval of two organizations which investigated Panama Canal matters and was formally adopted when the present accounting system was established in 1932. It has been considered a fair and reasonable rate, as the Government at various times has paid much higher rates for the use of money.

Interest chargeable to operations is not included on the balance sheet and no interest charge against the Canal is actually made by the United States Treasury.

Total revenues on the foregoing statement represent receipts which must be covered into the United States Treasury and relinquished from control of the Panama Canal. Earnings repayable to Canal appropriations, and reexpendable by the Canal, are deducted from gross operating expenditures, in order to present a comparison of funds covered into the Treasury with funds chargeable to operating account, exclusive of capital additions.

TABLE No. 21.—*Revenues, expenses, and computed surplus*

Fiscal year	Tolls	Civil revenues	Business profits	Total revenues	Net appropriation expenses ¹	Net revenues	Capital interest 3 percent ²	Computed surplus ³
1914-1920	\$83,303,581.67	\$1,206,572.86	\$526,098.34	\$35,046,259.87	\$96,657,706.89	\$1,611,507.02	\$14,674,904.74	\$12,611,507.02
1921	11,281,919.31	213,866.19	594,211.20	12,090,116.70	9,378,300.14	2,461,816.36	15,253,780.02	\$12,213,148.18
1922	11,193,883.57	192,208.85	323,233.16	11,708,851.48	8,469,017.63	3,239,833.85	15,203,400.18	\$4,610,721.18
1923	17,507,630.52	184,213.54	1,140,612.50	18,832,456.56	8,230,777.56	10,391,709.00	15,190,400.33	\$1,508,672.29
1924	24,289,003.16	392,250.73	901,624.12	25,583,478.01	8,923,903.39	16,659,572.62	15,093,730.49	\$1,417,888.92
1925	21,374,604.12	207,954.04	765,916.85	22,348,535.01	8,066,633.44	13,081,841.57	15,093,730.49	\$1,417,888.92
1926	22,927,456.03	217,080.90	841,310.29	23,985,846.82	8,543,468.47	15,442,378.35	15,093,730.49	\$37,397.71
1927	24,217,185.32	391,623.50	876,536.90	25,485,345.02	9,547,715.02	15,937,630.60	15,093,730.49	\$89,049.81
1928	26,943,513.11	232,532.57	736,719.43	27,912,765.11	9,501,200.82	18,411,564.29	15,033,374.55	\$3,376,535.00
1929	27,123,534.33	243,391.39	737,850.26	28,104,775.98	10,187,150.71	17,917,625.27	15,013,374.55	\$2,901,250.72
1930	27,077,117.36	340,255.35	760,971.66	28,187,344.37	9,893,920.93	18,293,423.44	14,987,527.89	\$3,305,895.55
1931	24,644,530.39	346,030.35	562,704.17	25,553,344.91	10,693,353.53	14,859,991.38	14,943,807.06	\$3,305,895.55
1932	327,444.23	327,444.23	557,045.44	21,066,881.39	10,239,211.84	11,827,670.55	14,943,807.06	\$3,305,895.55
1933	19,621,158.61	310,014.16	1,135,708.62	21,066,881.39	9,555,672.02	11,511,208.37	14,907,732.16	\$3,591,911.34
1934	23,065,065.16	96,666.67	1,366,755.12	25,528,486.96	7,931,333.77	17,597,152.19	15,124,193.39	\$2,557,899.37
1935	81,957.68	119,915.21	1,021,216.61	24,442,152.19	9,481,429.57	14,960,722.62	15,124,193.39	\$3,163,470.77
1936	23,506,806.46	98,775.74	917,300.14	24,546,906.90	9,675,067.13	14,871,839.77	15,159,597.04	\$3,287,757.27
1937	23,147,433.54	90,335.19	824,612.60	24,130,140.18	10,289,624.05	13,840,516.13	15,205,397.30	\$3,131,451.93
1938	23,215,192.39	106,929.55	681,272.48	24,042,345.67	9,575,624.32	14,566,721.35	15,229,992.24	\$3,675,476.38
1939	23,699,413.82	118,480.75	1,033,886.06	24,829,609.85	10,145,272.18	14,684,337.67	15,250,404.68	\$3,908,061.01
1940	21,177,243.04	5,528,226.05	17,205,997.08	497,076,221.33	225,838,505.71	271,237,715.62	301,662,042.90	\$2,955,578.11
Total	474,341,998.20	5,528,226.05	17,205,997.08	497,076,221.33	225,838,505.71	271,237,715.62	301,662,042.90	\$3,942,437.28

¹ After deduction of Canal earnings repaid to appropriations.² Interest prior to July 12, 1920, is included in capital investment account.³ Deficits.

Figures for years 1934 to 1939, inclusive, revised to include increase of \$180,000 due to increase in annual payment to the Republic of Panama from \$250,000 to \$430,000 per year in accordance with treaty ratified by Congress July 25, 1939.

The absence of tax charges is compensated for by the inclusion in Canal operating accounts of the direct costs of civil government, health and welfare activities. Neither capital nor operating expenses of the Panama Canal include the cost of the military and naval establishments on the Isthmus; however, all important exchanges of services with these interests are covered by cash settlements, or reciprocal allowances.

By including in the accounts all revenues properly applicable to Canal activities and by charging against the total revenue the net appropriation expenses including charges for depreciation and interest at 3 percent on the capital invested but excluding any charge to amortize the investment, there has accumulated as of June 30, 1940, as shown by the foregoing table, a deficit of \$30,424,327.28.

TABLE No. 22.—*Capital refundments*

Balance June 30, 1939 (revised)	\$287,556,100.81
Cash covered into United States Treasury	21,961,329.54
Business profits (table No. 8)	\$642,052.74
Revenue due United States Treasury (table No. 9)	21,322,276.80
Total	309,520,430.35
Appropriations, fiscal year 1940 (detail below)	\$25,174,731.87
Less: Net capital additions, current year (table No. 14)	16,485,193.11
Net appropriation for operating account	8,989,538.76
Net capital refundments, June 30, 1940	300,530,891.59

SCHEDULE OF OPERATING APPROPRIATIONS¹

Fiscal year	Maintenance and operation	Sanitation	Civil government	Miscellaneous	Annual payment to Panama	Total
1914-24	\$59,018,907	\$6,800,000	\$7,126,670	² \$151,344.55	³ \$1,000,000	\$74,096,921.55
1925	5,851,210	586,266	991,670		250,000	7,679,146.00
1926	7,140,000	653,216	942,150		250,000	8,985,366.00
1927	5,986,094	670,000	999,980		250,000	7,906,074.00
1928	5,830,000	670,000	1,100,000		250,000	7,850,000.00
1929	6,832,000	722,000	1,172,400		250,000	8,976,400.00
1930	8,000,000	820,000	1,201,000		250,000	10,271,000.00
1931	10,162,470	753,900	1,295,190		250,000	12,461,560.00
1932	9,359,808	782,189	1,351,689		250,000	11,743,686.00
1933	11,891,011	755,650	1,300,000		250,000	14,196,661.00
1934	11,172,700	698,426	1,235,278	⁴ 1,150,000.00	430,000	14,686,404.00
1935	4,974,490	768,501	792,935		430,000	6,962,926.00
1936	6,000,000	874,616	1,022,984		430,000	9,227,597.00
1937	9,149,201	899,793	1,073,950		430,000	11,552,944.00
1938	8,519,000	918,000	1,131,760	⁵ 5,000.00	430,000	11,093,764.00
1939	8,149,000	933,800	1,167,325	⁶ 155,000.00	430,000	10,835,125.00
1940	22,823,087	1,004,535	1,180,802	⁷ 36,307.87	430,000	25,474,731.87
Total	201,755,978	19,310,892	25,085,780	1,497,652.42	6,260,000	253,910,302.42
Less: Net capital additions, 1922 to 1940 (table No. 14)						48,734,274.06
Net appropriation for Canal maintenance and operation						205,176,028.36

¹ Operating appropriations include authorization for capital construction.² Appropriations for increase in compensation.³ N. R. A., \$1,000,000; repatriation of unemployed aliens, \$150,000.⁴ Appropriation for memorial to Maj. Gen. George W. Goethals.⁵ Navy appropriation.⁶ Covers payments to Panama 1921 to 1921. Payments from 1913 to 1920 charged to cost of construction \$2,000,000.

The total deposits covered into the United States Treasury from the beginning of Canal construction, with minor adjustments to reconcile changes in accounting process, amount to \$505,706,919.95, and deducting therefrom net appropriations for operation amounting to \$205,176,028.36 as shown above, produces the net capital refundment balance of \$300,530,891.59. Deposits covered into the Treasury consist principally of the earned revenues cited in table No. 21, which total \$497,076,221.33, the balance being made up of sales of property, principally during the construction period, and return of appropriation balances.

Although above table shows a net cash refundment of \$300,530,-891.59, such refundment is not deductible from net capital investment as shown in table No. 14, which is considered as measuring the value of the Panama Canal as an instrument of public utility upon which a perpetual return should be earned; furthermore, annual interest on net asset valuation chargeable to operating account is not included in cash transactions with the United States Treasury. Such interest at 3 percent from 1921 to 1940 would have amounted to \$301,622,042.90 as shown in table No. 21, and would have extinguished all capital refundments to date, if such interest charges had been assessed against Canal revenues.

TABLE NO. 23.—*Balance of revenues and refundments*

DEBITS	
Revenue due U. S. Treasury (table No. 9)	\$199, 404. 95
Appropriated cash in U. S. Treasury (table No. 8)	3, 998, 741. 50
Appropriated cash with fiscal officers (table No. 8)	3, 793, 418. 70
Accounts receivable (table No. 10)	1, 556, 015. 79
Stores (table No. 11)	5, 290, 310. 16
Work in progress (table No. 12)	191, 810. 62
Deferred charges (table No. 13)	897, 024. 56
Total debits	15, 926, 726. 28
CREDITS	
Accounts payable (table No. 15)	2, 619, 026. 99
Reserve for repairs (table No. 17)	366, 610. 01
Reserve for leave (table No. 18)	670, 015. 78
Deferred credits (table No. 19)	1, 004, 571. 86
Total credits	4, 660, 224. 64
Net current accounts	11, 235, 501. 64
Less proportion under capital investment (table No. 14)	4, 120, 000. 00
Balance	7, 115, 501. 64

A revolving fund now fixed at \$4,120,000, is set up in Canal accounting for working capital, and is credited to capital investment account in addition to funds used for construction and equipment, the total constituting the base for capital interest computations. Net working capital in excess of the revolving fund is considered as a temporary advance of Treasury funds, but is usually less than appropriated funds not withdrawn from the Treasury. Working capital invest-

ments are in constant process of accrual and liquidation for account of the United States Treasury.

TABLE NO. 24.—*Canal revenues*

	Fiscal year 1940	Fiscal year 1939
Tolls.....	\$21,177,243.04	\$23,699,413.82
Postal surplus.....	15,338.78	18,959.36
Licenses, fees, fines, etc.....	102,125.62	86,910.89
Miscellaneous.....	1,016.35	1,059.30
Total.....	21,295,723.79	23,806,343.37

Canal revenues shown above comprise earnings which by law must be covered into the United States Treasury as miscellaneous receipts, United States revenues, and relinquished from control of the Panama Canal, as distinguished from earnings repayable to Canal appropriations shown in tables Nos. 25 and 26.

Owing to a change in the law made effective at the beginning of the fiscal year 1934, the appropriation for postal expenses was discontinued, and postal receipts have been applied to defray such expenses, instead of being covered directly into the United States Treasury, as formerly, and only the surplus of postal receipts over postal expenses is for account of United States revenues.

TABLE NO. 25.—*Canal earnings, expenses, and net revenues*

	Expenses	Earnings	Net expenses
Executive department:			
Executive offices.....	\$617,922.36	\$291,094.65	\$326,827.71
Clubs and playgrounds.....	83,000.00	-----	83,000.00
Total.....	700,922.36	291,094.65	409,827.71
Accounting department:			
Comptroller's office.....	518,587.79	335,138.32	183,449.47
Paymaster's office.....	51,632.25	30,926.41	20,705.84
Collector's office.....	55,378.90	34,167.58	21,211.32
Total.....	625,598.94	400,232.31	225,366.63
Washington office.....	418,702.32	198,654.32	220,048.00
Civil government:			
Civil affairs.....	20,533.89	-----	20,533.89
Customs.....	37,289.83	393.00	36,896.83
Division of schools.....	544,860.17	61,852.75	483,007.42
Fire protection.....	146,376.54	275.50	146,101.04
Police and prisons.....	554,185.69	80,726.73	473,458.96
Magistrates' courts.....	20,013.86	-----	20,013.86
District court.....	5,790.00	-----	5,790.00
Total.....	1,328,049.98	143,247.98	1,185,802.00
Postal service.....	470,815.12	470,815.12	-----
Health department:			
Chief health office.....	56,709.58	7,540.52	49,169.06
Gorgas Hospital.....	976,181.43	501,357.35	474,824.08
Colon Hospital.....	197,069.16	119,485.50	77,523.66
Corozal Hospital.....	119,231.85	28,680.05	90,551.80
Palo Seco colony.....	47,535.26	29,714.83	17,820.43
Line dispensaries.....	120,018.73	49,968.00	70,049.83
Quarantine service.....	99,741.62	64,344.16	35,397.46
Sanitation, Panama.....	32,294.44	1,325.92	30,968.52
Sanitation, Colon.....	23,812.68	2,999.71	20,812.97

TABLE NO. 25.—*Canal earnings, expenses, and net revenues*—Continued

	Expenses	Earnings	Net expenses
Health department—Continued.			
Sanitation, Zone.....	\$159,101.00	\$66,689.49	\$92,411.51
Street cleaning and garbage collection, Panama.....	123,146.21	92,359.73	30,786.48
Street cleaning and garbage collection, Colon.....	56,900.40	42,681.20	14,219.20
Total.....	2,011,682.36	1,007,147.36	1,004,535.00
Technical divisions:			
Office engineer.....	424,236.73	380,724.54	43,512.19
Surveys.....	124,932.96	60,499.68	64,433.28
Total.....	549,169.69	441,224.22	107,945.47
Public buildings and grounds:			
Chief quartermaster's office.....	53,166.18	35,400.00	17,766.18
District quartermaster:			
Balboa.....	231,189.32	71,616.60	159,572.72
Pedro Miguel.....	26,993.91	18,162.85	8,831.06
Gamboa.....	22,781.03	15,608.29	7,172.74
Gatun.....	21,259.89	14,727.48	6,532.41
Cristobal.....	83,503.11	54,098.22	29,404.89
Total.....	438,893.44	209,613.44	229,280.00
Marine division:			
Marine superintendent.....	31,132.50	7,614.00	23,518.50
Port Captain, Balboa:			
General.....	142,150.50	4,756.90	137,393.60
Admeasurement of vessels.....	29,708.73	—	29,708.73
Pilotage.....	170,555.63	87,723.00	82,832.63
Handling lines.....	118,688.96	122,644.00	1 3,955.04
Tugs.....	136,404.27	109,638.08	26,766.19
Launches.....	92,180.17	94,485.00	1 2,304.83
Port Captain, Cristobal:			
General.....	93,193.14	3,832.26	89,360.88
Admeasurement of vessels.....	40,320.86	—	40,320.86
Pilotage.....	204,204.27	212,317.00	1 8,112.73
Handling lines.....	125,716.27	130,806.00	1 5,089.73
Tugs.....	149,591.61	163,036.22	1 13,444.61
Launches.....	71,593.28	85,506.00	1 13,912.72
Aids to navigation.....	267,351.92	38,805.18	228,546.74
Total.....	1,672,792.11	1,061,163.64	611,628.47
Locks operation and maintenance:			
Pacific locks:			
Miraflores Locks.....	574,305.57	—	574,305.57
Pedro Miguel Locks.....	471,512.19	—	471,512.19
Total.....	1,045,817.76	—	1,045,817.76
Atlantic locks: Gatun Locks.....	634,709.20	—	634,709.20
Total.....	1,680,526.96	—	1,680,526.96
Dams and spillways:			
Gatun Dam.....	24,882.69	—	24,882.69
Gatun Spillway.....	4,388.37	—	4,388.37
Madden Dam.....	30,889.29	—	30,889.29
Total.....	60,160.35	—	60,160.35
Dredging division:			
Atlantic entrance.....	256,717.33	—	256,717.33
Gatun Lake.....	186,944.17	—	186,944.17
Gaillard Cut.....	1,268,360.17	—	1,268,360.17
Miraflores Lake.....	25,672.71	—	25,672.71
Pacific entrance.....	274,119.13	—	274,119.13
Cristobal Harbor.....	21,031.95	—	21,031.95
Removal of floating obstructions.....	29,564.37	—	29,564.37
Maintenance of floating cranes.....	37,212.90	—	37,212.90
Dredging division work.....	453,940.13	481,444.80	1 27,504.67
Total.....	2,553,562.86	481,444.80	2,072,118.06
Municipal expenses:			
Street lighting.....	18,461.84	—	18,461.84
Water for municipal purposes.....	23,400.00	—	23,400.00
Roads, streets, and sidewalks.....	103,494.34	—	103,494.34
Sewer system.....	50,797.66	—	50,797.66
Thatcher ferry.....	103,989.31	—	103,989.31
Total.....	300,146.15	—	300,146.15

¹ Denotes credit balance.

TABLE No. 25—*Canal earnings, expenses, and net revenues—Continued*

	Expenses	Earnings	Net expenses
Miscellaneous general expenses:			
Railroad tracks maintenance	\$19,959.67		\$19,959.67
Recruiting and repatriating employees	18,570.70		18,570.70
Repatriating alien ex-employees	2,837.31		2,837.31
Transportation on the Isthmus	158,483.78		158,483.78
Damage to vessels	13,304.43		13,304.43
Canal Zone experiment gardens	75,670.07	\$60,670.07	15,000.00
Depreciation on Canal general property	1,200,000.00		1,200,000.00
Annual payment to the Republic of Panama	130,000.00		130,000.00
Cash relief to alien ex-employees	76,409.91		76,409.91
Net Canal expenses	14,807,258.21	4,765,307.91	10,041,950.30

SUMMARY

Canal revenues (table No. 24)	\$21,295,723.79
Net Canal expenses	10,041,950.30
Net Canal revenues	11,253,773.49

The earnings of the divisions engaged in the transiting of vessels through the Canal, as well as earnings of sanitation and civil government divisions, are deducted from gross expenses to arrive at the net expenditure from Canal appropriations, which in turn is deducted from Canal revenues to arrive at net Canal revenues, exclusive of business division profits.

Earnings of the executive offices and accounting department represent principally a proportional charge against business divisions of the Panama Canal and the Panama Railroad Co. Business divisions are reimbursed for this proportional expense by adding a surcharge to the direct cost on all work performed. The Panama Railroad's proportion is distributed to the various units of that organization.

The Government's contribution to the operation and maintenance of clubs and playgrounds was \$83,000 in 1940. All expense in excess of this amount is paid from receipts and profits from the operation of the clubhouses.

The earnings of the Washington office comprise charges against business storehouse operations to cover a proportional part of the cost of purchasing, inspection, and handling of material used by business divisions or sold to outside interests, which expense is covered through surcharges added to the price of material.

TABLE NO. 26.—*Business expenses, revenues, and profit or loss*

Division	Expenses	Revenues	Profit or loss
Electric power system.....	\$638,408.49	\$946,501.46	\$308,092.97
Electric work.....	1,831,476.90	1,811,809.44	10,332.54
Telephone, telegraph, and signal work.....	177,268.88	177,268.88	.....
Water system.....	465,199.76	544,355.06	79,155.30
Municipal work.....	9,384,292.99	9,400,027.50	15,734.51
Shops and dry-docks.....	6,063,682.06	6,063,961.62	60,279.56
Wharfage (Panama Railroad rental).....	.....	317,800.85	317,800.85
Fuel oil plants.....	777,372.32	821,124.68	43,752.36
General storehouses:			
Regular operations.....	14,069,444.64	14,087,780.50	18,335.86
Sale of Government property (net).....	.....	52,876.77	52,876.77
Motor transportation.....	655,947.91	668,349.06	12,401.15
Motor car repair shops.....	217,978.15	224,940.39	6,962.24
Building division.....	5,140,393.18	5,152,702.72	12,309.54
Panama Canal Press.....	275,646.69	300,180.06	24,533.37
Gold quarters.....	641,592.60	641,592.60	.....
Silver quarters.....	306,931.52	306,130.28	1,801.24
Garages.....	21,243.95	32,244.08	11,000.13
District quartermasters' supplies.....	372,759.58	391,134.06	18,334.48
Sand and gravel operations.....	310,074.77	314,936.70	4,861.93
Public works, Panama.....	389,678.93	412,439.90	22,760.97
Public works, Colon.....	233,175.23	248,338.00	15,162.77
Total.....	41,912,608.55	42,916,494.61	1,033,886.06

¹ Denotes deficit.

The profit on business operations as above, amounting to \$1,033,886.06, compares with profits in 1939 of \$681,272.48. However, \$317,800.85 of the increase in current year profits is due to transfer of \$218,800.85 from wharves and piers repair reserve accrued to June 30, 1939, from rental paid by Panama Railroad Co. for these facilities, plus rental of \$99,000 for the current fiscal year; it having been administratively determined that this revenue is no longer required for repair expenditure.

Profits on public works, Panama and Colon, amounting to \$37,923.74 represent interest which has been currently reported for coverage into general funds of the United States Treasury. The balance of the total profits, amounting to \$995,962.32, will be immediately covered into the Treasury as miscellaneous receipts, United States revenues, in accordance with regulations.

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels and government of the Canal Zone. The annual appropriation acts for the Panama Canal authorize the use of appropriated funds for the conduct of auxiliary business activities, provided that funds so advanced are recovered through earnings, and with the further proviso that any net profit derived from such business activities be covered annually into the United States Treasury.

TABLE No. 27.—Balances in appropriation and fund accounting ledger, June 30, 1940

Assets	Assets					Total
	U. S. Treasury appropriations	Cash on hand	Accounts receivable	Transfers available	Work in progress and suspense	Storehouse stock
Maintenance and operation, Panama Canal	\$3,598,851.55	\$3,520,678.06	\$1,394,303.09	\$21,291.82	\$245,019.81	\$5,199,826.23
Sanitation, Canal Zone, Panama Canal	31,764.11	64,085.84	148,321.42	-----	-----	74,851.51
Civil government, Panama Canal and Canal Zone	57,082.67	87,282.30	5,411.28	-----	-----	15,632.12
Postal funds, Canal Zone (special fund)	64,443.17	115,355.72	7,950.00	-----	-----	-----
Repatriation of unemployed aliens, Panama Canal	90,000.00	5,468.20	-----	-----	-----	-----
Memorial to Maj. Gen. George W. Goethals	156,000.00	508.58	-----	-----	3,401.42	-----
Miscellaneous receipts, United States revenues	-----	199,404.95	-----	995,962.32	-----	-----
Total	3,998,741.50	3,992,823.65	1,556,015.79	1,017,254.14	248,511.23	5,240,310.16

Liabilities	Liabilities					Total
	Working capital allotment	Accounts payable	Transfers payable	Special liabilities	Funded reserves	Balance
Maintenance and operation, Panama Canal	\$4,010,000.00	\$2,344,884.99	\$995,962.32	-----	\$4,776,379.35	\$1,852,743.90
Sanitation, Canal Zone, Panama Canal	100,000.00	117,433.24	6,180.26	\$55,400.68	-----	-----
Civil government, Panama Canal and Canal Zone	10,000.00	103,558.27	11,007.45	41,472.65	-----	-----
Postal funds, Canal Zone (special fund)	-----	25,150.49	4,023.19	87,374.58	-----	73,240.63
Repatriation of unemployed aliens, Panama Canal	-----	-----	71.92	-----	-----	95,396.28
Memorial to Maj. Gen. George W. Goethals	-----	-----	-----	-----	-----	160,000.00
Miscellaneous receipts, United States revenues	-----	1,195,367.27	-----	-----	-----	-----
Total	4,120,000.00	3,844,394.26	1,017,254.14	164,247.91	4,776,379.35	2,181,380.51

This table shows the status of Panama Canal working capital by the various appropriations and funds by which it is separately accountable under existing laws and Treasury regulations.

A revolving fund of \$4,120,000 is set aside in Canal accounting to cover the net investment in current accounts, which sum is included in the capital investment account (table No. 14).

The following table shows the detail of the funded reserves stated in the foregoing table as \$4,776,379.35.

TABLE NO. 27-A.—*Funded reserves, fiscal year 1940*

	Balance, July 1, 1939	Accruals	Expendi- tures	Balance, June 30, 1940
Marine division:				
Tugs and craneboats	\$228,931.28	\$29,640.00		\$258,571.28
Launches	68,543.22	22,055.42		58,826.38
Launch <i>Morlin</i> , construction			\$2,285.88	
Launch <i>Perico</i> , construction			5,342.84	
Launch <i>Pouapano</i> , construction			5,342.84	
Launch <i>Snapper</i> , construction			5,342.85	
Launch <i>Wahoo</i> , construction			13,457.85	
Machine barges	11,493.26	420.00		11,913.26
Total	308,967.76	52,115.42	31,772.26	329,310.92
Dredging division:				
Tugs and craneboats	115,131.57	68,485.00		183,616.57
Launches	12,553.10	9,638.26		7,353.38
Launch <i>Grouper</i> , construction			14,837.98	
Dredges	264,240.00	88,080.00		352,320.00
Dump scows	245,906.47	62,438.19		297,555.06
<i>No. 125</i> , construction			10,789.60	
Machine barges	232,166.72	23,875.00		220,691.07
New drill barge			35,350.65	
Lighters	31,998.88	10,048.94		40,151.06
Utility barge <i>No. 35</i>			553.83	
New sand barge			1,342.93	
Total	901,996.74	262,565.39	62,874.99	1,101,687.14
Total, transit divisions	1,210,964.50	314,680.81	94,647.25	1,430,998.06
Electric power system:				
Hydroelectric plant, Gatun	159,701.95	32,520.00		192,221.95
Diesel electric plant, Miraflores	78,594.22	27,840.00		106,434.22
Substations	195,194.51	29,520.00		224,714.51
Transmission system	91,758.27	23,520.00		115,278.27
Madden Dam system	70,369.37	21,120.00		91,489.37
Electric ranges	96,309.80	12,456.00		108,765.80
Total	691,928.12	146,976.00		838,904.12
Electric work:				
Fixed property	30,881.90	4,689.36		35,571.26
Equipment	4,536.85	794.30		5,331.15
Total	35,418.75	5,483.66		40,902.41
Water system:				
Pump station buildings	23,056.53	3,384.00		26,440.53
Pump station machinery	50,306.39	7,344.00		54,613.88
New pumps, Paraiso			1,881.31	
New pumps, Gamboa			1,155.20	
Filter plant buildings	91,979.73	16,872.00		108,851.73
Filter plant machinery	33,251.64	6,780.00		33,568.70
4-way valve, Miraflores			2,796.12	
Filter tables and valves, Mount Hope			2,877.60	
Wash water controller, Mount Hope			789.22	
Reservoirs and tanks	47,530.27	7,410.00		54,970.27
Pipe lines—large mains	132,871.12	17,796.00		114,347.76
Gamboa to Miraflores (portion)			36,319.36	
Pipe lines—distribution	88,284.53	12,744.00		79,014.23
Bolivar Highway to locks, Gatun			22,014.25	
Total	467,280.21	72,360.00	67,833.06	471,807.15

TABLE NO. 27-A.—*Funded reserves, fiscal year 1940—Continued*

	Balance, July 1, 1939	Accruals	Expendi- tures	Balance, June 30, 1940
Municipal work:				
Fixed property	\$1,477.10	\$2,525.00		\$4,002.10
Equipment	34,074.43	54,086.74	46,417.84	41,743.33
Total	35,551.53	56,611.74	46,417.84	45,745.43
Mechanical shops:				
Balboa shops	71,688.57	44,043.61		115,732.18
Balboa railroad shops	22,718.49	6,094.20		28,812.69
Cristobal shops	30,893.81	13,346.88		44,240.69
Equipment, Balboa	125,142.58	61,045.22	138,967.25	50,220.55
Equipment, Cristobal	117,653.77	25,622.53	40,140.19	103,136.11
Total	368,127.22	153,152.44	179,107.44	342,172.22
Fuel oil plants:				
Balboa:				
Pumping plant	26,386.33	4,263.84		30,650.17
Storage tanks	54,079.20	8,818.20		62,897.40
Pipe lines	63,185.49	16,849.92		80,035.41
Dock No. 4		3,300.00		3,300.00
Cristobal:				
Pumping plant	26,466.47	4,317.72		30,784.19
Storage tanks	120,562.88	21,522.72		88,816.36
Steel tank, Mount Hope			53,269.24	
Pipe lines	155,547.67	24,792.00		180,339.67
Total	446,228.04	83,894.40	53,269.24	476,853.20
General storehouses:				
Fixed property	28,074.00	29,225.69		57,299.69
Equipment	39,320.55	6,129.23	1,584.00	43,865.78
Total	67,394.55	35,354.92	1,584.00	101,165.47
Motor transportation division:				
Fixed property	16,776.26	5,510.00		22,286.26
Motor vehicles	49,417.33	83,296.61	98,174.60	34,539.34
Total	66,193.59	88,806.61	98,174.60	56,825.60
Motor car repair shops:				
Fixed property	13,721.33	2,712.00		16,433.33
Equipment	6,823.48	3,939.00		10,762.48
Total	20,544.81	6,651.00		27,195.81
Building division:				
Fixed property	3,527.57	2,106.00		5,633.57
Equipment	47,559.90	5,362.78	25,711.36	27,211.32
Total	51,087.47	7,468.78	25,711.36	32,844.89
Panama Canal Press:				
Equipment	25,489.23	3,947.00	8,686.94	20,749.29
Gold quarters:				
Fixed property	24,455.47	188,376.00		4,600.89
New quarters, Balboa			201,768.70	
New quarters, Cristobal			2,806.29	
Alterations and improvements			3,565.59	
Total	24,455.47	188,376.00	208,230.58	4,600.89
Silver quarters:				
Fixed property	67,758.22	31,993.69		¹ 3,527.13
New quarters, Mount Hope			38,063.94	
New quarters, Silver City			61,418.89	
Alterations and improvements			3,796.21	
Total	67,758.22	31,993.69	103,279.04	¹ 3,527.13
Garages:				
Fixed property	37,699.38	6,242.19		42,872.40
Addition, Balboa			1,069.17	
Total	37,699.38	6,242.19	1,069.17	42,872.40

¹ Indicates overexpenditure.

TABLE NO. 27-A.—*Funded reserves, fiscal year 1940*—Continued

	Balance, July 1, 1939	Accruals	Expendi- tures	Balance, June 30, 1940
District quartermasters' supplies:				
Gasoline stations	\$8,451.45	\$2,439.00		\$10,893.45
Equipment	11,455.87	5,124.63	\$612.02	15,968.48
Total	19,910.32	7,563.63	612.02	26,861.93
Clubhouse business structures:				
Fixed property	20,322.84	20,124.70		17,395.69
Bathhouse, Far Fan Beach			23,051.85	
Total	20,322.84	20,124.70	23,051.85	17,395.69
Total, business divisions	2,445,389.75	915,006.76	817,027.14	2,543,369.37
Contingent balance	40,516.60		25,130.47	15,386.13
Total reserve for replacements	3,696,870.85	1,229,687.57	936,804.86	3,989,753.56
Total reserve for repairs (table No. 17)	395,504.13	501,417.38	530,311.50	366,610.01
Total reserve for leave ² (table No. 18)	177,273.77	716,601.15	473,859.11	420,015.78
Total, funded reserves (table No. 27)	4,269,648.75	2,447,706.10	1,940,975.50	4,776,379.35

² Less \$250,000.



ALPHABETICAL INDEX

	Page
Accidents, marine.....	42, 72, 73
Accounts, payable (financial table No. 15).....	118
Accounts, receivable (financial table No. 10).....	115
Accounting department:	
Accounting system.....	101, 102
Financial, including tables.....	101-133
Functions.....	60
Administration:	
General.....	2
Organization.....	60-62
Personnel, changes in.....	61
Administration of estates.....	98
Agriculture, experiment garden activities.....	69, 70
Aids to navigation, lights, buoys, beacons, etc.....	42
Aircraft, commercial aviation.....	99, 100
Air mail:	
Commercial aviation.....	99, 100
Postal system.....	95, 96
Albrook Field, post office, new.....	94
Aliens. (See Employees, Employment, and Unemployed.)	
Allotments:	
Capital, 1941.....	74-76
Financial tables.....	101-133
Amusements and recreation.....	70-72
Ancon-Balboa, construction at.....	51
Animal and motor transportation operations.....	54
Anniversary celebration, twenty-fifth.....	79
Applications for positions:	
Applicants found eligible for employment, silver employees.....	67, 68
Eligibility procedure, silver employees.....	67, 68
Employment conditions on the Isthmus.....	51-53
Appointments, personnel (<i>see also</i> Employments).....	61
Appropriated funds (financial table No. 8).....	112, 113
Appropriations:	
Financial tables.....	101-133
Ten-year construction program.....	76, 77
Third locks project.....	78, 79
Areas in the Canal Zone.....	80
Army vessels, repairs.....	46, 47
Arrests, statistics.....	88-90
Assets, capital (financial table No. 6).....	110
Assistant to the Governor, appointed.....	61
Athletic field, Balboa, fill between Panama Railroad tracks and Gaillard Highway.....	87, 88
Athletics.....	70-72
Attendance at public schools, average daily.....	93

Automobiles:	Page
Death by accidents	90
License statistics	98, 99
Aviation, commercial	99, 100
Balance of revenue and refundments (financial table No. 23)	125, 126
Balance sheet (financial table No. 1)	104-106
Balances in appropriations and fund accounting ledger (financial table No. 27)	130, 131
Ballast traffic	21-24
Barracks for lock guards, Miraflores, construction of	51
Barracks and mess hall, United States Navy, construction of	51
Bathhouse, Farfan Beach, construction of	51
Bentz, Paul A., general counsel, appointment of	61
Betterments:	
Ten-year construction program	76, 77
Work in progress (financial table No. 12)	116, 117
Births, vital statistics	82
Buildings:	
Additional needs	77
Capital allotment, fiscal year 1941	74-76
Construction, repair, and maintenance, various towns	50-53
Financial tables	101, 133
General program	76, 77
Quarters for employees	50-53, 75, 76, 86, 87
Burdick, B. F., chief of office and general purchasing officer, appointment of	61
Business expenses, revenues and profits or loss (financial table No. 26) ..	129
Business operations:	
Panama Canal:	
Building construction and maintenance	50-53
Electrical division	48
Fuel oil, Diesel oil, gasoline and kerosene	50
Mechanical and marine work	46-48
Motor and animal transportation	54
Obsolete and unserviceable property and equipment	50
Panama Canal Press	54
Purchase and inspections in the United States	49
Quarters for employees	50-53
Replacement of quarters for American employees	52, 53
Revenues derived from rental of lands in Canal Zone	54, 55
Ship chandlery and other storehouse supplies	49, 50
Panama Railroad:	
Coal	56, 57
Commissary division	57, 58
Hotels	58, 59
Land and leases	57
Mindi dairy	59
Railroad	55, 56
Real estate operations	57
Receiving and forwarding agency	56
Steamship line	59
Telephones and telegraphs	57
Equipment (financial table No. 5)	109

Business operations—Continued.	Page
Financial tables.....	101-133
Fixed property (financial table No. 4).....	108, 109
Business, private, limited by new treaty between United States and Republic of Panama.....	97
Camp Paraiso, post office, new.....	94
Canal. (<i>See</i> Panama Canal.)	
Canal, third locks project.....	78, 79
Canal earnings and expenses and net revenues (financial table No. 25).....	126-128
Canal record operations.....	54
Canal revenues (financial table No. 24).....	126
Canal traffic. (<i>See</i> Traffic.)	
Canal transits, frequency of transit of vessels.....	25-27
Canal Zone:	
Area.....	80
Census, 16th decennial.....	80, 81
Vital statistics.....	81-83
Capacity of Canal, increasing, third locks project.....	78, 79
Capital allotment, 1941.....	74-76
Capital investment.....	101-118
Capital refundment (financial table No. 22).....	124, 125
Capitalization, depreciation, and maintenance, financial tables.....	101-133
Cargo ships.....	21-23
Cargoes:	
Average tonnage, tolls, and tons of cargo per cargo-carrying vessel.....	24
Ballast traffic.....	21-24
Customs activities.....	97
Laden traffic.....	21-24
Origin and destination.....	15-19
Principal commodities.....	20, 21
Receiving and forwarding agency, Panama Railroad, operations.....	56
Tanker traffic.....	10, 11
Tons of, by fiscal years.....	9
Trade routes (statement).....	14, 15
Traffic in 1940.....	5-28
Cash relief for disabled employees.....	68, 69
Cattle:	
Meat purchases, commissary division operations.....	58
Mindi dairy operations.....	59
Pasture areas in Canal Zone.....	80
Celebration, twenty-fifth anniversary.....	79
Cement shed, construction of, Cristobal.....	76
Census of Canal Zone, decennial, April 30, 1910.....	80, 81
Central Labor Office, establishment of.....	62
Changes in administration.....	62
Changes in personnel.....	61
Channels, maintenance of, and special projects.....	36-38
Atlantic entrance, Cristobal Harbor and Gatun Lake.....	37
Gaillard Cut, maintenance and excavation.....	37
Pacific entrance, Balboa Harbor and Miraflores Lake.....	37
Special project No. 1, deepening Pacific entrance channel and Miraflores Lake channel.....	38
Special project No. 8, widening of channel at lower end of Gatun locks.....	38

Channels, maintenance of, and special projects—Continued	Page
Special project No. 11, removing shoal areas, Cristobal Harbor.....	38
Special project No. 13, widening Culebra reach, Gaillard Cut.....	38
Cholera, Asiatic, spread of.....	84
Civil affairs division, activities.....	93-100
Clubs and playgrounds divisions, functions and activities.....	70-72
Coaling plants; coal sales.....	56, 57
Coccol:	
Rock crushing plant.....	87
Townsite.....	87
Colon:	
City, municipal improvements.....	87
Corridor.....	87
Fire.....	57, 87, 91
Commemorative issues, stamps.....	94
Commercial traffic (Canal). (See Traffic, Canal.)	
Commissary division operations.....	57, 58
Consolidated statement of income, expenses, and net revenue (financial table No. 20).....	121, 122
Construction and repair:	
Buildings and quarters.....	50-53
Mechanical division work for Panama Canal departments.....	47, 48
Convicts. (See Prisoners.)	
Corporations, foreign, licenses.....	99
Cost, capital investment.....	101-118
Corozal Hospital, improvements at.....	76
Corridor, Colon.....	87
Credits, deferred (financial table No. 19).....	120, 121
Cristobal, construction at.....	51
Culebra reach, Gaillard Cut, special project No. 13, widening.....	38
Custodial funds, receipts and disbursements (financial table No. 9).....	114, 115
Customs operations (statement).....	97
Dairies, milk production.....	59
Damage to vessels in Canal waters, legislation regarding payment of claims.....	72, 73
Dams. (See each, Gatun Dam, Madden Dam, etc.)	
Deaths:	
Administration of estates.....	98
Vehicle traffic accidents.....	88
Vital statistics.....	81, 82
Deferred charges (financial table No. 13).....	117
Deferred credits (financial table No. 19).....	120, 121
Departments, organization and changes.....	60-62
Deportations:	
Convicts and undesirables.....	89
Repatriation of unemployed aliens.....	68
Depreciation, financial tables.....	101-133
Diablo Heights, post office, new.....	94
Diablo Heights, construction at.....	51
Diesel oil. (See Oil.)	
Disabled employees, cash relief for.....	68, 69
Disbursements. (See Expense.)	
Diseases. (See Vital statistics.)	
Dispatching ships through the Canal, hours of operation.....	30
Displacement tonnage, vessels paying tolls on.....	13

	Page
Drafting room, Miraflores, construction of.....	51
Dredging, special projects, channels, lakes, harbors, and cut.....	38
Dredging division:	
Activities.....	36-41
Driftwood, disposal of, from Madden Lake area.....	40
Floating equipment employed.....	40, 41
Floating obstructions, including water hyacinths, removal of.....	40
Sand and gravel operations.....	39
Driftwood, disposal of, from Madden Lake area.....	40
Drydocks:	
Business operations.....	46
Financial tables.....	101-133
Dry season, 1940 water supply.....	35
Duties, customs, activities (statement).....	97
Earnings:	
Business operations, Panama Canal and Panama Railroad Co.....	45-59
Coal sales.....	56, 57
Commissary division operations.....	57, 58
Earnings and replacements.....	3, 4
Financial tables.....	101-133
Hotels.....	58, 59
Land licenses, Panama Canal.....	54, 55
Land and land leases, Panama Railroad Co., real estate operations...	57
Milk production.....	59
Net revenues, Canal, 1940, Panama Railroad Co.....	101-106
Railroad.....	55, 56
Receiving and forwarding agency.....	56
Telephones, electric clocks and electric printing telegraphs, gross revenue.....	57
Earthquakes.....	44
Education, public school system.....	92, 93
Electric light. (<i>See</i> Electric power.)	
Electric power:	
Business operations.....	48
Canal operations, power for.....	32-34
Financial tables.....	101-133
Hydroelectric stations operations.....	32, 33
Transmission line interruptions.....	33
Electrical division, business operations.....	48
Eligibility, number of silver applicants possessing.....	67, 68
Eligibility procedure, silver employees.....	67, 68
Employees:	
Cash relief for disabled employees.....	68, 69
Force employed, including distribution, recruiting, and turn-over....	62-67
Superannuated native employees, Panama Railroad Co.....	69
Wage adjustments.....	66
Employment:	
Recruiting and turn-over, including force distribution and force employed.....	62-67
Repatriation of unemployed aliens.....	68
Silver employment program.....	67, 68
Vacancies, filling with young United States citizens.....	62

Equipment (except floating and rolling):	Page
Business equipment (financial table No. 5)	109
Obsolete property and equipment, disposal of	50
Equipment, floating:	
Canal equipment (financial table No. 3)	108
Employed by the dredging division	40, 41
Repairs by the mechanical division for Canal and Railroad	47, 48
Estates, administration of	98
Examination for positions, eligibility procedure, silver employees	67
Executive department:	
Assistant to Governor, appointment of	61
Central labor office	62
Functions	61
Executive secretary, appointment of	61
Expansion of water supply system	75
Expenses and revenues. (See Revenues and expenses.)	
Experiment garden, botanical operations	69, 70
Farfan Beach, bathhouse, construction of	51
Ferry service and statistics	41
Fill, athletic field in Balboa between Panama Railroad tracks and Gaillard Highway	87, 88
Filtration plants, maintenance	86
Financial and statistical tables and statements	101-133
Accounting system	101, 102
Capital account, Canal	101-106
List of financial tables	103, 104
Net revenues:	
Canal	101-106
Railroad	102
Fire, Colon. (See Colon.)	
Fire and police division activities	88-91
Floating equipment. (See Equipment, floating.)	
Floods	35
Food supplies, commissary division operations	57, 58
Force employed, including distribution and turn-over	62-67
Foreign corporations, licenses	99
Foreign naval vessels using the Canal	13
Fort Clayton, Gaillard Highway, relocation of	75, 76
Free transits, vessels entitled to	13, 14
Fuel oil. (See Oil.)	
Fuel oil plants, revenues	50
Funded reserve (financial table No. 27-A)	131-133
Funds, financial tables	101-133
Gaillard Cut:	
Channel excavation	37
Special project No. 13	38
Gaillard Highway, relocation of, Fort Clayton	76
Gamboa, construction at	51
Gardens, experiment	69, 70
Gasoline, receipts and issues. (See Oil.)	
Gatun, construction at	51
Gatun hydroelectric station, operation	33
Gatun Lake; channel excavation statistics	37
Gatun locks, approach, special project No. 8	38

	Page
Government.....	80-100
Gravel plant, Gamboa, sand and gravel stock.....	39
Harbors:	
Improvement and maintenance of Balboa and Cristobal Harbors.....	37
Special project No. 1, deepening Pacific entrance channel.....	38
Special project No. 11, removing shoal areas, Cristobal outer harbor.....	38
Harbor terminals, operations, fiscal years 1938, 1939, 1940.....	56
Health department:	
Chief health officer, appointment of.....	61
Corozal Hospital, improvements.....	75, 76
Curtaiment of issue of land licenses in Canal Zone.....	54, 55
Functions of department.....	61
Gorgas Hospital, improvements.....	75, 76
Health conditions on the Isthmus.....	81
Quarantine and immigration service.....	83, 84
Highways. (See Roads.)	
Homicides.....	88, 89
Hospitals:	
Expansion and improvement of facilities.....	74-76
Patient days.....	83
Hotels, operations.....	58, 59
Hours of operation of Canal.....	30
Humidity.....	43, 44
Hyacinths, water, removal of from cut and lakes.....	40
Hydroelectric stations, operations.....	32, 33
Hydrology. (See Meteorology.)	
Immigration:	
Service operations.....	83, 84
Visas.....	96
Income. (See Revenues.)	
Increasing capacity of Canal:	
Third locks project.....	78, 79
Special construction division.....	62
Special engineering division.....	62
Infants, vital statistics.....	82
Inspection:	
Fire protection.....	90, 91
Purchases and inspections of materials in the United States.....	49
Insurance companies, licenses and statistics.....	99
Insured mail, Canal Zone postal system.....	95
Introduction, explanatory remarks and general statistics on operation of Canal.....	1-4
Investigations and plans for third locks project.....	78, 79
Kerosene, receipts and issues. (See Oil.)	
Labor. (See Employees; Employment.)	
Laboratory, Miraflores, soil and structural, construction of.....	51
Laboratory, municipal division testing.....	85
Laden traffic.....	21-24
Lakes. (See each, as Gatun Lake, Madden Lake, etc.)	
Land:	
Areas in Canal Zone.....	80
Licenses in Canal Zone.....	54, 55
Panama Railroad leases.....	57
Rental revenues.....	54

	Page
Larkin, Col. Thomas B., supervising engineer in charge of special construction division.....	61
Laws, Canal Zone:	
Enforcement, police division activities.....	88-90
Magistrates' courts, activities.....	91, 92
Leases, land, Panama Railroad operations.....	57
Legislation:	
Act to amend Canal Zone code relative to damages to vessels, etc., occasioned by the operations of the Canal.....	72, 73
Barro Colorado Island—creation of Canal Zone botanical area.....	73, 74
General.....	72-74
Postal Service amendment.....	73
Punishment for stowaways found aboard ships in Canal Zone waters.....	74
Unlawful entry into military reservations.....	74
Liabilities, financial tables.....	101-133
Licenses:	
Insurance companies.....	99
Land licenses in force in the Canal Zone.....	54
Foreign corporations.....	99
Peddlers.....	98
Ships runners.....	98
Vehicles.....	98, 99
Lighthouses. (<i>See</i> Lights and lighting.)	
Lights and lighting; marine.....	42
Locks:	
Barracks, Miraflores, construction of.....	51
Operations; hours:	
Atlantic locks.....	31
Pacific locks.....	31
Third set, activity pertaining to.....	78, 79
Lockages and lock maintenance.....	31, 32
Madden Dam, general.....	36
Madden hydroelectric station, operations.....	32, 33
Madden Lake, filling elevation.....	35, 36
Magistrates' courts, activities.....	91, 92
Mail:	
Commercial aviation.....	99, 100
Postal system in Canal Zone.....	93-96
Malarial rate.....	82, 83
Marine division:	
Accidents to shipping.....	42
Activities.....	41, 42
Aids to navigation.....	42
Salvage and towing operations.....	42
Marine work, repairs to vessels.....	47
Material and supplies:	
Financial table No. 11.....	116
Obsolete property and equipment, disposal of.....	50
Purchases and inspections in the United States.....	49
Ships chandlery.....	49, 50
Meat purchases, commissary division activity.....	58

Mechanical division:	Page
Business operations.....	46, 47
Drydocks.....	46
Financial.....	46
Plant improvements.....	48
Vessels, repairs.....	47
Work other than marine.....	47, 48
Meteorology, hydrology, and seismology:	
Air temperatures.....	43
Precipitation, calendar year 1939.....	43
Seismology.....	44
Tides.....	44
Winds and humidity.....	43, 44
Milk bottling plant operations, commissary division.....	59
Mindi dairy operations.....	59
Miraflores Diesel electric station operations.....	33
Miraflores Lake:	
Excavation statistics.....	37
Special project No. 1, deepening channel to Pacific entrance.....	38
Money orders, Canal Zone system.....	94, 95
Motor transportation division, operations.....	54
Municipal engineering division.....	85-88
Nationality of vessels using Canal.....	12, 13
Naval vessels, foreign:	
Repairs.....	47
Transits.....	13
Navigation, aids to. (<i>See</i> Aids to navigation.)	
Obstruction to navigation, removal by dredging division.....	38, 39
Oil:	
Fuel and Diesel, gasoline and kerosene, receipts and issues.....	50
Fuel oil plants, revenues.....	50
Tanker traffic in 1940.....	10, 11
Operation and maintenance of Canal:	
Auxiliary enterprises.....	2
Business operations.....	45-59
Explanatory remarks.....	1-4
Financial tables.....	101-133
Operation and maintenance, department of, functions.....	60, 61
Order, public, police division activities.....	88-90
Ore ships.....	22, 23
Organization (<i>see also</i> under each):	
Appointments.....	61
Changes in administration.....	62
Changes in personnel.....	61
Departments.....	60-62
Force employed, including distribution and turnover.....	62-67
General remarks.....	60-62
Panama Canal:	
Auxiliary enterprises.....	2
Business operations.....	45-55
Capital investment.....	101-106
Financial tables.....	101-133
Hours of operation.....	30
Net revenues 1940.....	101-106

Panama Canal—Continued	Page
Operation and maintenance, explanatory remarks.....	1-4
Operation and trade (<i>see also</i> under each subject).....	5-44
Third locks project.....	78, 79
Twenty-fifth anniversary.....	79
Panama Canal Record operations.....	54
Panama Canal Press operations.....	54
Panama City municipal improvements.....	87
Panama Railroad Co.:	
Business operations.....	55-59
Financial tables.....	101-133
Functions of department.....	61
Net revenues, 1940.....	102
Real estate section.....	57
Superannuated native employees.....	69
Panama Republic relations with Panama Canal.....	96, 97
Paraiso, Camp, post office, new.....	94
Parcel post, Canal Zone postal system.....	95
Pardon board activities.....	92
Passenger ships.....	21-23
Passengers:	
Aviation.....	100
Ships, summary of movement at Canal in 1940.....	29, 30
Pasture areas in the Canal Zone.....	80
Pay, rates of adjustment.....	66
Payments, annual, to Republic of Panama under terms of new treaty.....	96, 97
Peddler, licenses.....	98
Pedro Miguel, construction at.....	51
Personnel:	
Appointment of officials.....	61
Central labor office, establishment of.....	62
Force employed, including distribution, recruiting, and turnover.....	62-67
Personnel administration functions.....	62
Wage adjustments.....	66
Pipe lines (water) maintenance.....	86
Playgrounds (<i>see also</i> Clubs and playgrounds).	
Playground site, construction of.....	87, 88
Police and fire division activities.....	88-91
Population of Canal Zone, April 1940, sixteenth decennial.....	80, 81
Posts, division of, activities.....	93-96
Post offices, new.....	94
Postal system in the Canal Zone.....	93-96
Power. (<i>See</i> Electric power.)	
Precipitation, calendar year 1939.....	43
Printing plant operations.....	54
Prisoners:	
Committed to penitentiary.....	89
Deportations.....	89
Labor.....	89
Magistrates' courts, activities.....	91-92
Pardons and reprieves.....	92
Serving sentences.....	89
Profits, financial tables.....	103-133

Property:	Page
Business fixed property (financial table No. 4).....	108, 109
Canal fixed property (financial table No. 2).....	106, 107
Damage by fire.....	90, 91
Obsolete property and equipment, disposal of.....	50
Public health; conditions on the Isthmus.....	81
Public order, police division activities.....	88-90
Public school system, Canal Zone.....	92, 93
Public works, Panama and Colon cities (financial table No. 7).....	110, 111
Purchases and inspection of material in the United States.....	49
Quarantine service.....	83, 84
Quarry, Cocoli, and rock-crushing plant.....	87
Quarry, Sosa Hill, and rock-crushing plant.....	87
Quarters for American employees. (See Buildings.)	
Railroad. (See Panama Railroad.)	
Rainfall.....	43
Ratification of treaty between the United States and the Republic of Panama.....	96, 97
Real estate. (See Land.)	
Recruiting and turn-over of force, including force employed.....	62-67
Registered mail, Canal Zone postal system.....	95
Relations with Republic of Panama.....	96, 97
Relief, cash, for disabled employees.....	68, 69
Relocation, Gaillard Highway, Fort Clayton.....	76
Rents. (See Leases.)	
Repairs:	
Buildings and quarters.....	50-53
Mechanical division work for Canal and Railroad divisions.....	47, 48
To vessels.....	47
Repatriation of unemployed aliens.....	68
Replacement needs, clubhouse.....	71
Replacements:	
Financial tables Nos. 16 and 17.....	118-120
General.....	4
Old clubhouses.....	71
Ten-year construction program.....	76, 77
Reports, financial tables.....	101-133
Reserves:	
For repair (financial table No. 17).....	120
For replacement (financial table No. 16).....	118, 119
For vacation pay (financial table No. 18).....	120
Reservoirs, maintenance.....	86
Retirement, superannuated native employees.....	68, 69
Revenues and expenses:	
Business operations.....	45-59
Coal sales.....	56, 57
Commissary division operations.....	57, 58
Financial tables.....	101-133
General.....	3
Hotels.....	58, 59
Land leases, Panama Railroad Co.....	57
Land rentals, Canal.....	54, 55
Mechanical division gross revenues.....	46
Milk production.....	59

Revenues and expenses—Continued.	Page
Panama Canal Press	54
Railroad statistics	55, 56
Receiving and forwarding agency, Panama Railroad Co	56
Revenues and expenses, computed surplus (financial table No. 21) ..	122-124
Storehouse operations	49, 50
Telephones, electric clocks, and electric printing telegraphs	57
Roads:	
Cativa, construction of	74
Relocation of Gaillard Highway, Fort Clayton	76
Widened, constructed, renewed, etc., at various points	86
Rock-crushing plant:	
Cocoli	87
Sosa Hill Quarry	87
Safety section, establishment of	62
Sales to vessels:	
Commissary supplies	57, 58
Sales restrictions	58
Ship chandlery	49, 50
Salvage operations, marine division	42
Sand and gravel stock pile	39
Sanitation, health conditions on the Isthmus	81
Schools:	
Activities of public school system	92, 93
Buildings, construction of	75
Scrap sales	50
Seamen, shipping commissioner operations	98
Seismology	44
Services to shipping, general	3
Services to vessels:	
Agency services, Panama Railroad Co	56
General	3
Ship chandlery operations	49, 50
Sewers:	
Maintenance, repairs, and renewals	86
Panama and Colon improvements	87
Ship accidents. (<i>See</i> Accidents, marine.)	
Ship chandlery	49, 50
Ships runners, licenses	98
Shipping commissioner, activities	98
Shops, plant improvements, mechanical division	48
Sickness. (<i>See</i> Health department.)	
Sidewalks, maintenance	86
Silver personnel, general (<i>See also</i> Employees.)	66-69
Slides	38, 39
Soils and structural laboratory, construction of	51
Sosa Hill, quarry and rock crushing plant	87
Special construction division, establishment of	62
Special engineering section, establishment of	62
Stamps, commemorative issues for Canal Zone	94
Statistics, financial tables	101-133
Stayer, Col. Morrison C., chief health officer, appointment of	61
Streets. (<i>See</i> Roads.)	
Suicides	89

	Page
Superannuation of native employees, including statistics.....	68, 69
Supply department, functions.....	60
Tank ships.....	21-23
Tanker traffic:	
Number and daily average transits.....	11
Panama Canal net tonnage and tolls from tankers and others.....	11
Taxes. (See Licenses.)	
Telephones and telegraphs, business operations, Panama Railroad Co....	57
Temperatures, air.....	43
Tests, municipal division laboratory operations.....	85
Third locks project.....	78, 79
Tides.....	44
Tivoli Hotel, operations.....	58, 59
Tolls:	
Average per cargo-carrying vessel.....	24
Free transits, vessels entitled to.....	13, 14
From tankers and others.....	11
Tonnage. (See Traffic, Canal.)	
Townsites, development of.....	86, 87
Trade routes.....	14, 15
Traffic, Canal:	
Average tonnage, tolls, and tons of cargo per cargo-carrying vessel..	24
By fiscal years.....	9
By months.....	10
Cargo carried by leading maritime nations.....	12, 13
Classification of vessels.....	21-24
Displacement tonnage.....	13
Foreign naval vessels.....	13
General statistics.....	5-28
Nationality of vessels: Ocean-going vessels, tonnage and tolls.....	12
Origin and destination.....	15-19
Passengers, summary of movement at Canal, 1940.....	29, 30
Principal commodities.....	20, 21
Small commercial.....	14
Steam, motor, and other vessels.....	25
Tankers:	
Number and daily average transits.....	11
Panama Canal net tonnage and tolls, from tankers and others.....	11
Tolls.....	10
Tonnage, gross, of vessels.....	27, 28
Trade routes.....	14, 15
Transit frequency of vessels.....	25-27
Traffic regulation violations (statistics).....	89, 90
Trans-Isthmian highway.....	97
Transportation:	
Motor and animal transportation, operations.....	54
Repatriation of unemployed aliens.....	68
Treaty between United States and Republic of Panama, ratification of....	96, 97
Typhus fever.....	84
Undesirables, deportations.....	89
Upham, post office, new.....	94
Vessels:	
Accidents. (See Accidents, marine.)	
Agency services, Panama Railroad Co.....	56

Vessels—Continued.	Page
Customs activities.....	97
Repairs.....	46, 47
Shipping commissioner, activities.....	98
Visas, immigration.....	96
Vital statistics.....	81, 82
Wage adjustments.....	66
Wages, silver.....	67
Wang, Frank H., executive secretary, appointment of.....	61
Ward buildings, Palo Seco, construction of.....	51
Washington Hotel, operations.....	58, 59
Water areas in the Canal Zone.....	80
Water lines, maintenance.....	86
Water supply:	
Dry season, 1940.....	35
Floods.....	35
Gatun Lake source.....	34
Madden Lake.....	35, 36
Panama and Colon public works (financial table No. 7).....	110, 111
System, including maintenance.....	85, 86
Water supply system, expansion of.....	75
<i>White Shadow</i> , yacht, assistance rendered to.....	42
Winds.....	43, 44
Work in progress (financial table No. 12).....	116, 117
Yellow fever.....	83, 84



